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REPORT AND TRANSACTIONS

OF THE

DEVONSHIRE ASSOCIATION

FOR

THE ADVANCEMENT OF SCIENCE, LITERATURE,
AND ART.

[NEWTON ABBOT, JULY, 1884.]

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The Editor is requested by the Council to make it known to the Public, that the Committees and Authors alone are responsible for the facts and opinions contained in their respective Reports and Papers.

It is hoped that Members will be so good as to send to the Editor, the Rev. W. HANLEY, Clayhanger Rectory, Tiverton, not later than 15th January, 1885, a list of any *errata* they may have detected in the present volume.

Y. H. S. L.

L. M. B. O. T. H. S.

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1884-85.

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WINDEATT, T. W.
WORTH, R. N.
WORTHY, C.

TABLE SHOWING THE PLACES AND TIMES OF MEETING OF THE DEVONSHIRE ASSOCIATION,

With the Officers, Number of Members, and Number of Papers read, from its commencement.

PLACES, TIMES, &c.	PRESIDENTS.
EXETER— August 14th, 15th, 1862. 69 Members 6 Papers	Sir John Bowring, LL.D., F.R.S.
PLYMOUTH— July 29th, 30th, 1863. 80 Members 10 Papers	C. Spence Bate, Esq., F.R.S., F.L.S.
TORQUAY— July 20th, 21st, 1864. 92 Members 16 Papers	E. Vivian, Esq., M.A.
TIVERTON— June 28th, 29th, 1865. 99 Members 14 Papers	C. G. B. Daubeny, M.D., LL.D., F.R.S., Professor of Botany, Oxford.
TAVISTOCK— August 8th, 9th, 1866. 132 Members 18 Papers	The Earl Russell, K.G., M.G.C., F.R.S., &c.
BARNSTAPLE— July 23rd to 25th, 1867. 146 Members 26 Papers	W. Pengelly, Esq., F.R.S., F.G.S.

The Earl Fortescue
 J. R. Charter, Esq.
 J. Jerwood, Esq., M.A., F.G.S.

Mr. W. Cotte. Esq.

TABLE SHOWING THE PLACES AND TIMES OF MEETING, ETC.—Continued.

PLACES, TIMES, &c.	PRESIDENTS.	VICE-PRESIDENTS.	TREASURERS.*	SECRETARIES.*
BIDEFORD— Aug. 16th to 17th, 1871. 283 Members 28 Papers	Rev. Canon C. Kingsley, M.A., F.L.S., F.G.S.	J. A. Froude, Esq., M.A. The Mayor of Bideford (J. How, Esq.) Rev. F. L. Baseley J. R. Pine Coffin, Esq. Captain E. P. Charlewood, R.N. W. A. Deane, Esq. Rev. I. H. Gosset, M.A. General Sir E. Green Captain Moleworth, R.N. E. U. Vidal, Esq. N. Whitley, Esq. Captain Willett A. B. Wren, Esq.	E. Vivian, Esq., M.A. E. Simpkins, Esq.	Rev. W. Harpley, M.A. J. A. Parry, Esq.
EXETER— July 30 to Aug. 1, 1872. 294 Members 33 Papers	The Right Rev. Lord Bishop of Exeter	Rev. Canon C. Kingsley, M.A., F.L.S., F.G.S. The Mayor of Exeter (J. Harding, Esq.) The Sheriff (Horace G. Lloyd, Esq.) Sir L. Sir Jo. Sir J. K. A. Rev. I. H. S. Rev. Treasurer Hawker, M.A. J. Kennaway, Esq., M.P. E. Parfitt, Esq.	E. Vivian, Esq., M.A. W. Cotton, Esq.	Rev. W. Harpley, M.A. Rev. R. Kirwan, M.A., F.S.A. G. W. Ormerod, Esq., M.A., F.G.S. E. Parfitt, Esq.

<p>SIDMOUTH— July 22nd to 24th, 1873. 330 Members 26 Papers</p>	<p>The Right Hon. S. Cave, M.A., M.P.</p>	<p>of Exeter The Earl of Lord Sidney M.P. M.B.</p>	<p>E. Vivian, Esq., M.A. <i>Captain Ross, R.N.</i></p>	<p>Rev. W. Harpley, M.A. <i>J. Ingledy Mackenzie, Esq.,</i> M.B.</p>
<p>TRIGNMOUTH— July 28th to 30th, 1874. 327 Members 33 Papers</p>	<p>The Right Hon. the Earl of Devon</p>	<p>Th J. (ave, M.A., M.P. Th Clifford R. M. Dunn, Esq. E. Gulson, Esq. Rev. T. M.A. Rev. W. C. J. A. G. W. Ormerod, Esq., M.A., F.O.S. J. Parson, Esq. T. V. Wollaston, Esq., M.A., F.L.L. H. B. T. Wrey, Esq.</p>	<p>E. Vivian, Esq., M.A. <i>J. Whidborne, Esq.</i></p>	<p>Rev. W. Harpley, M.A. <i>G. W. Ormerod, Esq., M.A.,</i> F.O.S.</p>

* Italics indicate Local officers.

TABLE SHOWING THE PLACES AND TIMES OF MEETING, ETC.—Continued.

PLACES, TIMES, &c.	PRESIDENTS.	VICE-PRESIDENTS.	TREASURERS.*	SECRETARIES.*
TORRINGTON— July 27th to 29th, 1875. 356 Members 29 Papers	R. J. King, Esq., M.A.	The Right Hon. The Earl of Devon The Mayor of Torrington (T. Jackson, Esq.) Rev. S. Buckland, M.A. W. Cann, Esq. The Right Hon. Lord Clinton Rev. F. T. Colby, B.D., F.S.A. W. A. Deane, Esq. W. H. Gamlen, Esq. H. S. Gill, Esq. J. G. Johnson, Esq., M.P. W. H. Halliday, Esq., M.A. Dr. A. Kinerdon Rev. W. E. Hon. Mark Rolle J. C. Moore-Stevens, Esq. R. L. Tapley, Esq.	E. Vivian, Esq., M.A. H. R. Lovebond, Esq.	Rev. W. Harpley, M.A. Geo. Dow, Esq.
ASHBURTON— July 25th to 27th, 1876. 400 Members 33 Papers	Rev. Treasurer Hawker, M.A.	R. J. King, Esq., M.A. The Portreeve of Ashburton (P. F. S. Amery, Esq.) Baldwin J. P. Bastard, Esq. A. Channernowne, Esq., M.A., F.G.S. R. F. C. R. C. R. J. J. Rev. W. H. Thornton, B.A. J. Tozer, Esq. R. Tucker, Esq. J. Woodley, Esq. Rev. C. Worthy, M.A.	E. Vivian, Esq., M.A. H. S. Gereis, Esq., M.D., F.G.S.	Rev. W. Harpley, M.A. J. S. Amery, Esq.

* Italics indicate Local officers.

<p>KINGSBRIDGE— July 31st to Aug. 2nd, 1877. 604 Members 33 Papers</p>	<p>Ven. Archdeacon Earle, M.A. Rev. Treasurer Hawker, M.A. G. P. Bidder, Esq., C.E. L. B. Bowring, Esq., C.S.I. W. Cubitt, Esq. M.A. Rev. W. D. Pittman, M.A. Rev. John Power, M.A. Rev. J. Sloane-Evans, M.A.</p>	<p>E. Vivian, Esq., M.A. <i>B. Balkeill, Esq.</i></p>	<p>Rev. W. Harpley, M.A. <i>J. S. Hurrell, Esq.</i></p>
<p>PAIGINTON— July 30th to Aug. 1st, 1878. 471 Members 34 Papers</p>	<p>Sir Samuel White Baker, M.A., F.R.S., F.R.G.S. Ven. Archdeacon Earle, M.A. J. H. Batten, Esq., F.R.G.S. R. S. S. Carey, Esq., J.P. A. H. Dendy, Esq., M.A. J. T. M.R.C.S. Rev. R. I. C. I. F. I. Rev. T. R. K. Stebbing, M.A. Captain Synges, R.N. F. H. Trevithick, Esq.</p>	<p>E. Vivian, Esq., M.A. <i>A. Gregory, Esq.</i></p>	<p>Rev. W. Harpley, M.A. <i>W. Edward Tucker, Esq.</i></p>

* Italics indicate Local officers.

TABLE SHOWING THE PLACES AND TIMES OF MEETING, ETC.—Continued.

PLACES, TIMES, &c.	PRESIDENTS.	VICE-PRESIDENTS.	TREASURERS.*	SECRETARIES.*
ILFRACOMBE— July 22nd to 24th, 1879. 457 Members 34 Papers	Sir R. P. Collier, M.A.	Sir S. W. Baker, M.A., F.R.S., F.R.G.S. Rev. J. M. Chanter, M.A. J. R. Chanter, Esq. G. Doe, Esq. Rev. Treasurer Hawker, M.A. T. Hole. B.A. Esq.	E. Vivian, Esq., M.A. <i>C. G. Barnett, Esq.</i>	Rev. W. Harpley, M.A. <i>E. Slade-King, Esq. M.D.</i>
TORRIS— July 27th to 29th, 1880. 508 Members 41 Papers	H. W. Dyke Acland, M.A., M.D., LL.D., F.R.S., ETC.	Local Board of sq.) 1, F.R.S.A., F.L.S. R.C.S. A. Michelmore, Esq.) LL.B.A. 1, M.A., F.G.S. P. Esq., J.P. sq., M.A. Rev. J. Fowning, B.D. Rev. J. E. Risk, M.A. J. Roe, Esq. Rev. W. Watkins. R. H. Watson, Esq., J.P. T. W. Windeatt, Esq.	E. Vivian, Esq., M.A. <i>C. W. Croft, Esq.</i>	Rev. W. Harpley, M.A. <i>E. Windeatt, Esq.</i>

* Italics indicate Local Officers.

DAWLISH—
July 26th to 28th, 1881.
483 Members.
26 Papers.

Rev. Professor Chapman, M.A.

H. W. Dyke Achud, M.A., M.D., F.R.S., &c.
A. Baker, Esq., M.D.

B.A.

E. Vivian, Esq., M.A.
A. de Winter Baker,
L.R.C.P., M.R.C.S.

Rev. W. Harpley, M.A.
J. S. Wadborne, Esq.

the Local Board

CREDITON—
July 26th to 27th, 1882.
603 Members.
29 Papers.

J. Brooking Rowe, Esq.,
F.R.S., F.L.S.

M.A.

E. Vivian, Esq., M.A.
F. S. Sprague, Esq.

Rev. W. Harpley, M.A.
Rev. Frederick Smith, M.A.

J. Wresford, Esq., J.P.

* Italics indicate Local Officers.

RULES.

1. THE Association shall be styled the Devonshire Association for the advancement of Science, Literature, and Art.

2. The objects of the Association are—To give a stronger impulse and a more systematic direction to scientific enquiry in Devonshire; and to promote the intercourse of those who cultivate Science, Literature, or Art, in different parts of the county.

3. The Association shall consist of Members, Honorary Members, and Corresponding Members.

4. Every candidate for membership, on being nominated by a member to whom he is personally known, shall be admitted by the General Secretary, subject to the confirmation of the General Meeting of the Members.

5. Persons of eminence in Literature, Science, or Art, connected with the West of England, but not resident in Devonshire, may, at a General Meeting of the Members, be elected Honorary Members of the Association; and persons not resident in the county, who feel an interest in the Association, may be elected Corresponding Members.

6. Every *Member* shall pay an Annual Contribution of Half-a-guinea, or a Life Composition of Five Guineas.

7. Ladies only shall be admitted as Associates to an Annual Meeting, and shall pay the sum of Five Shillings each.

8. Every *Member* shall be entitled gratuitously to a lady's ticket.

9. The Association shall meet annually, at such a time in July and at such place as shall be decided on at the previous Annual Meeting.

10. A President, two or more Vice-Presidents, a General Treasurer, and one or more General Secretaries, shall be elected at each Annual Meeting.

11. The President shall not be eligible for re-election.

12. Each Annual Meeting shall appoint a local Treasurer and Secretary, who, with power to add to their number any Members of the Association, shall be a local Committee to assist in making such local arrangements as may be desirable.

13. In the intervals of the Annual Meetings, the affairs of the Association shall be managed by a Council, which shall consist exclusively of the following Members of the Association, excepting Honorary Members, and Corresponding Members:

(a) Those who fill, or have filled, or are elected to fill, the offices of President, General and Local Treasurers, General and Local Secretaries, and Secretaries of Committees appointed by the Council.

(b) Authors of papers which have been printed *in extenso* in the Transactions of the Association.

14. The Council shall hold a Meeting at Exeter in the month of January or February in each year, on such day as the General Secretary shall appoint, for the due management of the affairs of the Association, and the performing the duties of their office.

15. The General Secretary, or any four members of the Council, may call extraordinary meetings of their body, to be held at Exeter, for any purpose requiring their present determination, by notice under his or their hand or hands, addressed to every other member of the Council, at least ten clear days previously, specifying the purpose for which such extraordinary meeting is convened. No matter not so specified, and not incident thereto, shall be determined at any extraordinary meeting.

16. The General Treasurer and Secretary shall enter on their respective offices at the meeting at which they are elected; but the President, Vice-Presidents, and Local Officers, not until the Annual Meeting next following.

17. With the exception of the Ex-Presidents only, every Councillor who has not attended any Meeting, or adjourned Meeting, of the Council during the period between the close

of any Annual General Meeting of the Members and the close of the next but two such Annual General Meetings, shall have forfeited his place as a Councillor, but it shall be competent for him to recover it by a fresh qualification.

18. The Council shall have power to fill any Official vacancy which may occur in the intervals of the Annual Meetings.

19. The Annual Contributions shall be payable in advance, and shall be due in each year on the day of the Annual Meeting.

20. The Treasurer shall receive all sums of money due to the Association; he shall pay all accounts due by the Association after they shall have been examined and approved; and he shall report to each meeting of the Council the balance he has in hand, and the names of such members as shall be in arrear, with the sums due respectively by each.

21. Whenever a Member shall have been three months in arrear in the payment of his Annual Contributions, the Treasurer shall apply to him for the same.

22. Whenever, at an Annual Meeting, a Member shall be two years in arrear in the payment of his Annual Contributions, the Council may, at its discretion, erase his name from the list of members.

23. The General Secretary shall, at least one month before each Annual Meeting, inform each member by circular of the place and date of the Meeting.

24. Members who do not, on or before the day of the Annual Meeting, give notice, in writing or personally, to the General Secretary of their intention to withdraw from the Association, shall be regarded as members for the ensuing year.

25. The Association shall, within three months after each Annual Meeting, publish its Transactions, including the Rules, a Financial Statement, a List of the Members, the Report of the Council, the President's Address, and such Papers, in abstract or *in extenso*, read at the Annual Meeting, as shall be decided by the Council.

26. The Association shall have the right at its discretion of printing *in extenso* in its Transactions all papers read at the Annual Meeting. The Copyright of a paper read before any meeting of the Association, and the illustrations

of the same which have been provided at his expense, shall remain the property of the Author; but he shall not be at liberty to print it, or allow it to be printed elsewhere, either *in extenso* or in abstract amounting to as much as one-half of the length of the paper, before the first of November next after the paper is read.

27. The Authors of papers printed in the Transactions shall, within seven days after the Transactions are published, receive twenty-five private copies free of expense, and shall be allowed to have any further number printed at their own expense. All arrangements as to such extra copies to be made by the Authors with the printers to the Association.

28. If proofs of papers to be published in the Transactions be sent to Authors for correction, and are retained by them beyond four days for each sheet of proof, to be reckoned from the day marked thereon by the printers, but not including the time needful for transmission by post, such proofs shall be assumed to require no further correction.

29. Should the Author's corrections of the press in any paper published in the Transactions amount to a greater sum than in the proportion of twenty shillings per sheet, such excess shall be borne by the Author himself, and not by the Association.

30. Every *Member* shall, within three months after each Annual Meeting, receive gratuitously a copy of the Transactions.

31. The Accounts of the Association shall be audited annually, by Auditors appointed at each Annual Meeting, but who shall not be *ex officio* Members of the Council.

BYE-LAWS AND STANDING ORDERS.

1. In the interests of the Association it is desirable that the President's Address in each year be printed previous to its delivery.

2. In the event of there being at an Annual Meeting more Papers than can be disposed of in one day, the reading of the residue shall be continued the day following.

3. The pagination of the Transactions shall be in Arabic numerals exclusively, and carried on consecutively, from the beginning to the end of each volume; and the Transactions of each year shall form a distinct and separate volume.

4. The General Secretary shall bring to each Annual Meeting of the Members a report of the number of copies in stock of each 'Part' of the Transactions, with the price per copy of each 'Part' specified; and such report shall be printed in the Transactions next after the Treasurer's financial statement.

5. The General Secretary shall prepare and bring to each Annual Meeting brief Obituary Notices of Members deceased during the previous year, and such notices shall be printed in the Transactions.

6. An amount not less than 80 per cent. of all Compositions received from existing Life-Members of the Association shall be applied in the purchase of National Stock, or such other security as the Council may deem equally satisfactory, in the names of three Trustees, to be elected by the Council.

7. At each of its Ordinary Meetings the Council shall deposit at interest, in such bank as they shall decide on, and in the names of the General Treasurer and General Secretary of the Association, all uninvested Compositions received from existing Life-Members, all uninvested prepaid Annual Subscriptions, and any part, or the whole, of the balance derived from other sources which may be in the Treasurer's hands after providing for all accounts passed for payment at the said Meeting.

8. The General Secretary, on learning at any time between the Meetings of the Council that the General Treasurer has a balance in hand of not less than Forty Pounds after paying all Accounts which the Council have ordered to be paid, shall direct that so much of the said balance as will leave Twenty Pounds in the Treasurer's hand be deposited at Interest at the Torquay Bank.

9. The General Secretary shall be authorized to spend any sum not exceeding *Ten Pounds* per annum in employing a clerk for such work as he finds necessary.

10. The General Secretary shall, within one month of the close of each Annual Meeting of the Association, send to each Member newly elected at the said Meeting a copy of the following letter:—

Devonshire Association for the Advancement of Science, Literature, and Art.

SIR,—I have the pleasure of informing you that on the of July, you were elected a Member of the Association on the nomination of

The copy of the Transactions for the current year, which will be forwarded to you in due course, will contain the Laws of the Association. Meanwhile I beg to call your attention to the following statements:—

(1) Every Member pays an Annual Contribution of Half a Guinea, or a Life Composition of Five Guineas.

(2) The Annual Contributions are payable in advance, and are due in each year on the day of the Annual Meeting.

(3) Members who do not, on or before the day of the Annual Meeting, give notice in writing or personally to the General Secretary of their intention to withdraw from the Association are regarded as Members for the ensuing year.

The Treasurer's Address is—EDWARD VIVIAN, Esq., Woodfield, Torquay.—I remain, Sir, your faithful Servant,

Hon. Sec.

11. The reading of any Report or Paper shall not exceed twenty minutes, or such part of twenty minutes as shall be decided by the Council as soon as the Programme of Reports and Papers shall have been settled, and in any discussion which may arise, no speaker shall be allowed to speak more than ten minutes.

12. Papers to be read to the Annual Meetings of the Association must strictly relate to Devonshire, and, as well as all Reports intended to be printed in the Transactions of the Association, and prepared by Committees appointed by the

Council, must, together with all drawings intended to be used in illustrating them in the said Transactions, reach the General Secretary's residence not later than the 24th day of June in each year. The General Secretary shall, not later than the 7th of the following July, return to the authors all such Papers or drawings as he may decide to be unsuitable to be printed or to serve as illustrations in the said Transactions, and shall send the residue, together with the said Reports of Committees, to the Association's printers, who shall return the same so that they may reach the General Secretary's residence not later than on the 14th day of the said July, together with a statement of the number of pages each of them would occupy if printed in the said Transactions, as well as an estimate of the extra cost of the printing of such Tables, of any kind, as may form part of any of the said Papers and Reports; and the General Secretary shall lay the whole, as well as an estimate of the probable number of Annual Members of the Association for the year commencing on that day, before the first Council Meeting on the first day of the next ensuing Annual Meeting, when the Council shall select not a greater number of the Papers thus laid before them than will, with the other documents to be printed in the said Transactions, make as many sheets of printed matter as can be paid for with the sum of 60 per cent. of the subscriptions for the year of the said probable number of Annual Members, and any part or the whole of such balance, not derived from Compositions of existing Life Members, or from prepaid Annual Subscriptions, as may be lying at interest, as well as that which may be in the Treasurer's hands; this 'sum' shall be exclusive of the extra cost of the printing of such aforesaid Tables, which have been approved and accepted by the Council, provided the aggregate of the said extra cost do not exceed 6 per cent. of the said subscriptions; exclusive also of the printers' charge for corrections of the press; and also exclusive of the cost of printing an Index, a list of Errata, and such Resolutions passed at the next Winter Meeting of the Council, as may be directed to be so printed by the said Winter Meeting; and the number of Papers selected by the Council shall not be greater than will, with the Reports of Committees, make a Total of 40 Reports and Papers.

12. Papers communicated by Members for Non-Members, and accepted by the Council, shall be placed in the Programme below those furnished by Members themselves.

14. Papers which have been accepted by the Council cannot be withdrawn without the consent of the Council.

15. The Council will do their best so to arrange Papers for reading as to suit the convenience of the authors; but the place of a Paper cannot be altered after the Programme has been settled by the Council.

16. Papers which have already been printed *in extenso* cannot be accepted unless they form part of the literature of a question on which the Council has requested a Member or Committee to prepare a report.

17. Every meeting of the Council shall be convened by Circular, sent by the General Secretary to each Member of the Council not less than ten days before the Meeting is held.

18. All Papers read to the Association which the Council shall decide to print *in extenso* in the Transactions, shall be sent to the printers, together with all drawings required in illustrating them, on the day next following the close of the Annual Meeting at which they were read.

19. All Papers read to the Association which the Council shall decide not to print *in extenso* in the Transactions, shall be returned to the authors not later than the day next following the close of the Annual Meeting at which they were read; and abstracts of such Papers to be printed in the Transactions shall not exceed one-fourth of the length of the Paper itself, and must be sent to the General Secretary on or before the seventh day after the close of the Annual Meeting.

20. The Author of every paper which the Council at any Annual Meeting shall decide to print in the Transactions shall be expected to pay for all such illustrations as in his judgment the said Paper may require.

21. The printers shall do their utmost to print the Papers in the Transactions in the order in which they were read, and shall return every Manuscript to the author as soon as it is in type, *but not before*. They shall be returned *intact*, provided they are written on loose sheets and on one side of the paper only.

22. Excepting mere verbal alterations, no Paper which has been read to the Association shall be added to without the written approval and consent of the General Secretary; and

no additions shall be made except in the form of notes or postscripts, or both.

23. In the intervals of the Annual Meetings, all Meetings of the Council shall be held at Exeter, unless some other place shall have been decided on at the previous Council Meeting.

24. When the number of Copies on hand of any 'Part' of the Transactions is reduced to twenty, the price per copy shall be increased 25 per cent.; and when the number has been reduced to ten copies, the price shall be increased 50 per cent. on the original price.

25. The Association's Printers, but no other person, may reprint any Committee's Report printed in the Transactions of the Association, for any person, whether a Member of the said Committee, or of the Association, or neither, on receiving, in each case, a written permission to do so from the Honorary Secretary of the Association, but not otherwise; that the said printers shall pay to the said Secretary, for the Association, sixpence for every fifty Copies of each half sheet of eight pages of which the said Report consists; that any number of copies less than fifty, or between two exact multiples of fifty, shall be regarded as fifty; and any number of pages less than eight, or between two exact multiples of eight, shall be regarded as eight; that each copy of such Reprints shall have on its first page the words "Reprinted from the Transactions of the Devonshire Association for the Advancement of Science, Literature, and Art for — with the consent of the Council of the Association," followed by the date of the year in which the said Report was printed in the said Transactions, but that, with the exception of printer's errors and changes in the pagination which may be necessary or desirable, the said Reprint shall be in every other respect an exact copy of the said Report as printed in the said Transactions without addition, or abridgment, or modification of any kind.

26. The General Secretary shall, within one month after each Annual General Meeting, inform the Hon. Local Treasurer and the Hon. Local Secretary, elected at the said Meeting, that, in making or sanctioning arrangements for the next Annual General Meeting, it is eminently desirable that they avoid and discourage everything calculated to diminish the attendance at the General and Council Meetings, or to disturb the said Meetings in any way.

27. The Bye-Laws and Standing Orders shall be printed after the "Rules" in the Transactions.

28. All resolutions appointing Committees for special service for the Association shall be printed in the Transactions next before the President's Address.

29. Members and Ladies holding Ladies' Tickets intending to dine at the Association Dinner shall be requested to send their names to the Hon. Local Secretary on forms which shall be provided ; no other person shall be admitted to the dinner, and no names shall be received after the Monday next before the dinner.

REPORT OF THE COUNCIL.

As presented at the General Meeting, Newton Abbot, July 29th, 1884.

IN presenting this Report, the Council desire to record their deep sense of the serious losses sustained by death during the year now ended, no fewer than seventeen members having died since the last Meeting—a number unprecedented in the history of the Association. A brief tribute to the memory of each of the deceased members will be found below. (See page 52 *et seq.*)

The Twenty-second Annual Meeting commenced on Tuesday, July 31st, at Exmouth, and was continued during that and the two following days. There was a large attendance of members, the weather proved beautifully fine, and the welcome given was one of the most liberal and hearty the Association has ever received. The Council met at 2 p.m. in the Committee Room, Imperial Hotel, and at 3.30 p.m. the members were formally welcomed to Exmouth in the large hall of the Imperial Hotel by Sir J. B. Phear on behalf of the Local Committee, the compliment being gracefully acknowledged by Mr. J. Brooking Rowe, the retiring president.

The General Meeting was held at 4 p.m., and at 8 p.m. the President, the Very Rev. C. Merivale, Dean of Ely, delivered his introductory address in the presence of a large number of ladies and gentlemen.

On Wednesday, at 11 a.m., the reading and discussion of the following programme of reports and papers was commenced :

Eighth Report of the Committee on Scientific Memoranda	} <i>J. Brooking Rowe, F.S.A., F.L.S.</i>
Seventh Report of the Committee on Devonshire Celebrities	
Sixth Report of the Committee on Verbal Provincialisms	} <i>F. T. Elworthy.</i>
Sixth Report of the Committee on Devonshire Folk-Lore	
Fifth Report of the Committee on Barrows	<i>R. N. Worth, F.G.S.</i>

Fourth Report of the Committee on Works of Art in Devonshire	} <i>R. Dymond, F.S.A.</i>
Second Report of the Committee on the Meteorology of Devon—2nd Series . .	} <i>P. F. S. Amery.</i>
On a Flint Implement found on Torre Abbey Sands, Torbay, in 1883 . . .	} <i>W. Pengelly, F.R.S., F.G.S.</i>
Notice of the head of an Iron Halberd found in an excavation at Teignmouth, and of the place in which it was discovered .	} <i>G. Wareing Ormerod, M.A., F.G.S.</i>
On the Ancient History of Exmouth . .	} <i>J. B. Davidson, M.A., F.S.A.</i>
Notes on the Raleigh Family	} <i>T. N. Brushfield, M.D.</i>
Henry de Bracton	} <i>W. K. Willcocks, M.A.</i>
Some Recent Revisions of the Drake Chronology	} <i>Rev. J. Erskine Risk, M.A.</i>
A reply to a recent Critique of Notes on the Submarine Geology of the English Channel off the Coast of South Devon	} <i>Arthur Roope Hunt, M.A., F.G.S.</i>
Notes on Slips connected with Devonshire—Part VI.	} <i>W. Pengelly, F.R.S., F.G.S.</i>
Devonshire Lace	} <i>Mrs. Treadwin.</i>
Devonshire Cyder	} <i>Rev. Treasurer Hawker, M.A.</i>
Sir John Hawkins : Sailor, Statesman, Hero	} <i>R. N. Worth, F.G.S.</i>
Notes on the <i>Trichonema columnæ</i> . .	} <i>D. Shier, M.D.</i>
The Lichen Flora of Devonshire . . .	} <i>E. Parfitt.</i>
Geological Notes upon the Exe Valley Railway	} <i>Rev. W. Downes, B.A., F.G.S.</i>
Notes on the Submarine Geology of the English Channel off the Coast of South Devon. Part III.	} <i>Arthur Roope Hunt, M.A., F.G.S.</i>
Discoveries in the more Recent Deposits of the Bovey Basin, Devon	} <i>W. Pengelly, F.R.S., F.G.S.</i>
The Rocks of the Neighbourhood of Plymouth and their Stratigraphical Relations	} <i>R. N. Worth, F.G.S.</i>
On the Temperature and Coral Fauna of the Greensand Sea	} <i>E. Parfitt.</i>
Berry Castle and its Ancient Lords . .	} <i>C. Worthy.</i>
A Notice of some remarkable Devonshire Centenarians	} <i>Alfred Edwards.</i>
Devoniana—Part II.	} <i>J. T. White.</i>
On the occurrence of Barytes in the Culm-measure Limestones of Westleigh . .	} <i>Rev. W. Downes, B.A., F.G.S.</i>
Men and Manners in Stuart Plymouth .	} <i>R. N. Worth, F.G.S.</i>
Notes on Notices of the Geology and Palæontology of Devonshire. Part X.	} <i>W. Pengelly, F.R.S., F.G.S.</i>
Drake—The Arms of his Surname and Family (<i>communicated by J. Brooking Rowe, F.S.A., F.L.S.</i>)	} <i>H. H. Drake, M.A., PH.D.</i>

In the evening the Annual Dinner was held at the Imperial Hotel, when a very excellent repast was admirably served by the host to a company which numbered

eighty-seven. The President occupied the chair. By the liberality of the Local Committee the quality of the dinner was enhanced beyond its ordinary character in celebration of the Association attaining the twenty-first anniversary of its birth.

On Thursday, at 10 a.m., the reading of papers was resumed, and continued without interruption until 2 p.m., when the programme having been gone through, a General Meeting and a Meeting of the Council were held.

On Friday two excursions took place; for these, conveyances for one hundred persons, free of charge, were provided by the Local Committee. No. 1 was conducted by E. S. Kennedy, Esq., and A. J. Darke, Esq. This party visited Woodbury Church, the ancient British Camp at Woodbury, the Church of St. John in the Wilderness, and, here dividing into two equal portions, then visited respectively Marley and Bystock, where, at the courteous invitations of John Bryce, Esq., and J. P. Bryce, Esq., J.P., the members were welcomed and entertained at luncheon at 2 p.m., and afterwards shown the attractive features of their grounds. No. 2 party was conducted by Dr. Brushfield, of Budleigh Salterton, and visited the Pebble-ridge near that town, the Church at Otterton, Bicton Cross and Church, the Church with its Raleigh and other memorials at East Budleigh, and Hayes Barton, the birthplace of Sir Walter Raleigh. A cold collation was provided at East Budleigh for this party by the Local Committee.

It having been decided that the next meeting should be held at Newton Abbot, the following were elected officers for that occasion :

President: Rev. T. R. R. Stebbing, M.A. Vice-Presidents: Leonard Armstrong, Esq.; Admiral Cornish-Bowden, J.P.; R. W. Cotton, Esq.; J. B. Davidson, Esq., M.A.; Edward Fisher, Esq.; H. S. Gaye, Esq., M.D., J.P.; Rev. S. G. Harris, M.A.; A. R. Hunt, Esq., M.A., F.G.S.; The Very Rev. C. Merivale, D.D., D.C.L.; W. F. Moore, Esq.; D. R. Scratton, Esq., J.P.; Rev. H. Tudor, M.A.; Rev. G. Townsend Warner, M.A.; W. J. Watts, Esq., J.P., Chairman of the Local Board of Health, Newton Abbot. Hon. Treasurer: E. Vivian, Esq., M.A., Torquay. Hon. Local Treasurer: W. Vicary, Jun., Esq., Newton Abbot. Hon. Secretary: Rev. W. Harpley, M.A., F.C.P.S., Clayhanger, Tiverton. Hon. Local Secretary: Sidney Hacker, Esq., Newton Abbot.

The Council have published the President's Address, together with Obituary Notices of members deceased during

the preceding year, and the Reports and Papers read before the Association; also the Treasurer's Report, a List of Members, and the Rules, Standing Orders, and Bye-Laws; they have since added an Index, kindly prepared by Mr. P. O. Hutchinson, and a Table of Corrections.

A copy of the *Transactions* and Index has been sent to each member, and to the following Societies: The Royal Society, Linnæan Society, Geological Society, Anthropological Institute of Great Britain and Ireland, Royal Institution (Albemarle Street), the Society of Antiquaries, Devon and Exeter Institution (Exeter), Plymouth Institution, Torquay Natural History Society, Barnstaple Literary and Scientific Institution, Royal Institution of Cornwall (Truro), the Library of the British Museum, the Bodleian Library (Oxford), and the University Library (Cambridge).

The Council desire to add, that at their last Winter Meeting they sanctioned the publication of the work of the Committee on Domesday Book. This will be issued in sections, to accompany the annual volume of *Transactions*, and the first part will be sent out this year.

STATEMENT OF THE PROPERTY OF THE ASSOCIATION,

July 29th, 1884.

			£	s.	d.
Funded Property, Consols	.	.	400	0	0
Deposit at Interest in Torquay Bank	.	.	95	0	0
Balance in Treasurer's hand (26th July, 1884)	.	.	35	14	8
Arrears of Annual Contributions (valued at)	.	.	6	6	0
"Transactions" in Stock, 1863 ...	87 copies at	2s. Od.	8	14	0
" " 1864 ...	100 "	3s. Od.	15	0	0
" " 1865 ...	96 "	2s. 6d.	12	0	0
" " 1866 ...	75 "	3s. Od.	11	5	0
" " 1867 ...	72 "	6s. Od.	21	12	0
" " 1868 ...	47 "	6s. 6d.	15	5	6
" " 1870 ...	24 "	6s. Od.	7	4	0
" " 1871 ...	23 "	6s. 6d.	7	9	6
" " 1873 ...	32 "	6s. Od.	9	12	0
" " 1874 ...	37 "	8s. 6d.	15	14	6
" " 1875 ...	16 "	10s. Od.	8	0	0
" " 1876 ...	18 "	15s. Od.	13	10	0
" " 1877 ...	21 "	7s. 6d.	7	17	6
" " 1878 ...	9 "	12s. Od.	5	8	0
" " 1879 ...	26 "	7s. Od.	9	2	0
" " 1880 ...	26 "	12s. 6d.	16	5	0
" " 1881 ...	33 "	6s. Od.	9	18	0
" " 1882 ...	55 "	10s. Od.	27	10	0
" " 1883 ...	60 "	8s. Od.	24	0	0
			<u>£782</u>	<u>7</u>	<u>8</u>

(Signed) W. HARPLEY,
Hon. Secretary.

"When the number of copies on hand of any part of the 'Transactions' is reduced to twenty, the price per copy shall be increased 25 per cent.; and when the number has been reduced to ten copies, the price shall be increased 50 per cent. on the original price."—*Standing Order, No. 24.*

The "Transactions" in stock are insured against fire in the sum of £200. The vols. published in 1862, 1869, and 1872 are out of print.

SELECTED MINUTES OF COUNCIL, APPOINTING COMMITTEES.

Passed at the Meeting at Newton Abbot,

JULY, 1884.

8. That Rev. Professor Chapman, Rev. W. Harpley, Mr. W. Pengelly, Mr. J. Brooking Rowe, and Rev. T. R. R. Stebbing be a Committee for the purpose of considering at what place the Association shall hold its Meeting in 1886, who shall be invited to be the Officers during the year beginning with that Meeting, and who shall be invited to fill any official vacancies which may occur before the Annual Meeting in 1885; that Mr. Pengelly be the Secretary; and that they be requested to report to the next Winter Meeting of the Council, and, if necessary, to the first Meeting of the Council to be held in July, 1885.

9. That Mr. George Doe, Rev. W. Harpley, Mr. H. S. Gill, Mr. E. Parfitt, and Mr. J. Brooking Rowe be a Committee for the purpose of noting the discovery or occurrence of such Facts in any department of scientific inquiry, and connected with Devonshire, as it may be desirable to place on permanent record, but which may not be of sufficient importance in themselves to form the subjects of separate papers; and that Mr. J. Brooking Rowe be the Secretary.

10. That Mr. P. F. S. Amery, Mr. George Doe, Mr. R. Dymond, Rev. W. Harpley, Mr. P. Q. Karkeek, and Mr. J. Brooking Rowe be a Committee for the purpose of collecting notes on Devonshire Folk-Lore; and that Mr. George Doe be the Secretary.

11. That Mr. R. W. Cotton, Mr. R. Dymond, Mr. P. Q. Karkeek, Sir J. H. Kennaway, Mr. E. Windeatt, and Mr. R. N. Worth be a Committee for the purpose of compiling a list of deceased Devonshire Celebrities, as well as an Index of the entire Bibliography having reference to them; and that Mr. R. W. Cotton be the Secretary.

12. That Dr. Brushfield, Mr. A. Champernowne, Lord Clifford, Mr. R. Dymond, Mr. A. H. A. Hamilton, Mr. G. Pycroft, Mr. J. Shelly, and Mr. R. N. Worth be a Committee to prepare a Report on the Public and Private Collections of Works of Art in Devonshire; and that Mr. Dymond be the Secretary.

13. That Mr. J. S. Amery, Mr. G. Doe, Mr. R. Dymond, Mr. F. T. Elworthy, Mr. F. H. Firth, Mr. P. O. Hutchinson, Mr. P. Q. Karkeek, and Dr. W. C. Lake be a Committee for the purpose of noting and recording the existing use of any Verbal Provincialisms in Devonshire, in either written or spoken language; that Mr. F. T. Elworthy be the Editor, and that Mr. F. H. Firth be the Secretary.

14. That Mr. J. S. Amery, Mr. J. B. Davidson, Mr. G. Doe, Mr. R. Dymond, Rev. W. Harpley, Mr. J. S. Hurrell, Mr. P. O. Hutchinson, Sir John B. Phear, Mr. J. Brooking Rowe, and Mr. R. N. Worth be a Committee for editing and annotating such parts of *Domesday Book* as relate to Devonshire; and that Mr. J. Brooking Rowe be the Secretary.

15. That Mr. P. F. S. Amery, Mr. G. Doe, Mr. P. O. Hutchinson, Mr. E. Parfitt, Mr. J. Brooking Rowe, and Mr. R. N. Worth be a Committee to collect and record facts relating to Barrows in Devonshire, and to take steps, where possible, for their investigation; and that Mr. R. N. Worth be the Secretary.

16. That Mr. J. S. Amery, Mr. G. Doe, Mr. R. Dymond, Mr. T. C. Kellock, Mr. J. B. Paige-Browne, Mr. J. Brooking Rowe, and Mr. E. Windeatt be a Committee to obtain information as to peculiar tenures of land, and as to customs of Manor Courts, in Devonshire; and that Mr. E. Windeatt be the Secretary.

17. That Mr. D. R. Close, Mr. F. H. Firth, Rev. W. Harpley, Mr. E. Parfitt, and Mr. R. C. Tucker be a Committee for the purpose of making the arrangements for the Association dinner at Seaton, 1885; and that Mr. R. C. Tucker be the Secretary.

18. That Mr. T. H. Edmonds, Mr. E. E. Glyde, Mr. E. Parfitt, and Mr. P. F. S. Amery be a Committee to collect and tabulate trustworthy and comparable observations on the climate of Devon; and that Mr. P. F. S. Amery be the Secretary.

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PRESIDENT'S ADDRESS.

LADIES AND GENTLEMEN,—The heir to a great estate is often like the unfortunate alderman who swallowed a delicious morsel of turtle without having tasted it. A man born in the purple is too much accustomed from the very dawn of intelligence to the favourable incidents of his position, to be able to appreciate their value or enjoy them with genuine appetite; but this, which happens to princes who have always been princes, happens also to the great bulk of mankind. Like those whose titles and pre-eminence in the social scale attend them from their infancy, we all of us, the vulgar herd even as well as the members of the Devonshire Association, have imperial endowments, presenting to the reflective mind a curious contrast between the grandeur of the gifts themselves and the matter-of-fact indifference with which the possessors regard them.

The interval between a Shah and a shoeblick is not nearly so great as that between man with the endowments which have been slowly superadded to the human race, to be handed down as a common inheritance, and man starting bare and naked of all those acquisitions. To be, and to be accounted, swift and strong, rich and great, witty, wise, virtuous, are the things which men covet and delight in. But considering that we measure none of these things by any perfect standard, but that for us they all depend on one man's having more while others have less, and that the one-eyed is a king among the blind, we might all be made happy with the consciousness of personal excellence, if we would only lift our eyes from the too-crowded present and look a little into antiquity; for the old opinion that the human race has spent most of its time in growing worse and worse will not bear the light of modern enquiry.

The desire to trace back his own history to its earliest origin must long ago have tempted the intellect of man. The existing literature of the Hebrews contains in its opening

page a sketch of the origin of the world. That brief but luminous description, sublime in simplicity of expression, implies not merely that the writer himself had opened his mind to a vast and wonderful problem, but that many enquirers had before him pondered and discussed it. The page indeed is the first page of the book in which the description occurs; but the language, you will remark, is the language of conclusion. There is no intricacy of argument or amplitude of details, no threatening of censure or punishment to those who will not hear and accept the creed. It is evidently the already accepted wisdom of their wisest that is here presented to the Hebrew nation; and so, it would seem, for that nation at least, the subject ended. The last word had been spoken; no more was needed.

Among the subtle minds of ancient Greece many occupied themselves with speculations about the generation of the universe. Plato, in his *Timæus*, puts the question, "Was the world always in existence and without beginning, or created and having a beginning?" Still earlier Anaximenes had started the theory that animals were developed out of frogs which came to land, and that man himself had been developed out of the lower animals. In the work which has made Plato an English classic,* Professor Jowett brings together this and many other curious instances in which the ancients seem to have half-forestalled the latest word of modern science. "The mind of the Greek," he observes moreover, "was not confined to a period of four or six thousand years. He was able to speculate freely on the effects of infinite ages in the production of physical phenomena."†

None the less it must, I believe, be admitted, that anything like a real insight into the origin or genesis of the principal things which make the world of humanity what it is at present, is distinctively modern and of recent date. It is in our own age, though by no means exclusively in our own land, that the enquiry has been carried on with unprecedented vigour, along various lines of research, by illustrious students like Darwin and Wallace and Huxley and Herbert Spencer; like Sedgwick and Lyell and our own Pengelly; like Tylor and Lubbock and Galton, with many others of great name and fame. As time goes on we may expect that their conclusions, or many of them, will become the property of all

* In thus speaking I refer more to the value and engrossing interest of the introductions than even to the excellent rendering of the original dialogues.

† JOWETT'S *Plato*, vol. iii. p. 560.

educated persons—part of the ordinary furniture of the mind, an intellectual atmosphere enjoyed without expense. Borne up, as it were, on the wings of such predecessors, the thinkers of a future age may perhaps feel a fine scorn at our having wandered darkly in labyrinths, of which they from a new elevation will see all the windings and the outlets.

Any one, not an advanced student in languages and philology, opening at random a large English dictionary, such as Webster's, will be surprised to find how numerous are the words in his own language of which he does not know the meaning, and knows still less the origin. The men who think and teach are now, as it were, opening the great dictionary of the world, and for subject after subject, asking the questions, "What does this mean?" "How came this to be so?" And the human mind is so constituted, that when these questions have once been fairly asked, they cannot be set aside either by rebuke or by contempt. That the enquiry is unlawful, that the enquiry is useless, that the questions are such as by their very nature can never be answered, are suggestions sure to be made, and sure to be futile. Various motives, ambition, self-will, the need of employment, professional requirements, irresistible curiosity, or the ardent and unquenchable love of truth, carry men onward, and in the long run Wisdom is justified of all her children.

Was then the world always in existence, and without beginning? or created and having a beginning? May it not be possible and proper to answer, "Yes," to both alternatives? Instead of the great Cosmos, take as a type of it a well-built house. That at any rate, you will say, was created, and had a beginning. No doubt! But who created it, and when did it begin? Was it created by the bricklayers and carpenters, or by the master-builder, or by the architect, or by the architect's employer, or must we go back to the first designers of houses, from whom architects of the present day are intellectually descended? Did the house begin only when its building was ended, or did it begin when the first stone was laid, or when the plans were drawn, or when the stones had been quarried and the timbers hewn, or was it when the trees were planted that have supplied it with planks; or must we go further back to a time when the clay for the bricks had not yet been deposited under water, and when its limestone was still a brilliant mass of living coral? Common-sense compels us to say that a house was created and had a be-

ginning, and yet, as you see, we go back and back without ever finding its true creator, or its true beginning. And if from ancient forest and stratum of rock we still go further back to the elementary substances of the earth, and by help of Mr. Norman Lockyer resolve even the elements into subtlest ether, still that ether remains to be accounted for. At this point some men would think to save, as it were, the honour of God by allowing Him this impalpable remnant for direct creation. But upon a larger view, must not Matter, whatever it is, have been always in existence; or must we go back beyond it to an empty universe, to a Creator for infinite ages not yet ready to create, open to the famous taunt of Elijah, that "peradventure he sleepeth, and must be awaked"? To an unchangeable Cause, Omniscient and Omnipotent, we cannot rightly conceive of the idea suddenly occurring to create Matter, or to mould and modify Matter, or any other conditions of Nature, into stars and worms and human beings. Such an occurrence would be a change in the Unchanging. That all the works of God are as eternal as the Worker seems to be implied in the grand conception of the Divine Nature as "the One Spectator of all time and all existence." Thus, in one sense, the world was never created, and had no beginning, but always *was*,—a part of the Divine Consciousness; while, in another sense, things are never in one stay, everything is ceaselessly beginning and ending, and however far back the finite mind may push its enquiries, it will still find food for unending investigation and research. We are bound indeed to acknowledge that known unto God are all His works from the beginning, and bound at the same time to recognize that it is only by an accommodation to human intelligence that we can attribute any work to the Unchangeable, any beginning of operation to the Eternal.

Leaving Metaphysics, then, on one side, if Metaphysics will consent to be left there, Science would be well content for the moment to be able to map out a progression from the elemental star-dust to the existing development of the human mind. The astronomer shows us the stars and their satellites, condensing and solidifying to run in their appointed orbits. It is for the chemists and geologists to lay the table of the earth for the great banquet of life. The biologist has not yet arisen to explain the little step between organic life and chemical change. Since the lamented death of Bathybius,* and the murderous attacks upon Eozoon Canadense, this

* See the amusing *Log Letters from the Challenger*, by Lord GEORGE CAMPBELL, chap. ix. conclusion.

desired explanation seems further off than ever. But however the first seaweed budded, or the simplest protozoon began to feed, onward from these the continuity of evolution is being worked out with ever-decreasing intervals; and while Mr. Romanes, in his lately-published book on *Mental Evolution in Animals*, leads us up to the birth and infancy of Reason, a host of other eminent writers show its growth and working, as they trace out in various lines the origin of writing, of arithmetic, of cookery, of agriculture, of medicine, of music and the fine arts in general, of social life, of civilization, and, as included almost of necessity in the two latter, of law, morality, and religion.

Between a crystal and a plant, between a plant and an animal, between a jelly-fish and Julius Cæsar, the intervals seem to be enormous. Without pausing to consider the earlier gaps, we may notice that the jelly-fish itself seems to be separated by a vast interval from the animals below it, for the jelly-fish has acquired nerve-tissue. Along the fibres of this tissue run messages from the outer world to the group of nerve-cells called a ganglion. The cells, by reflex action, reflect or transmit the message once more along the nerve-fibres to the particular muscles which are called upon for action. The origin of this mechanism has been well illustrated by comparison with the channel of a stream. When an animal is devoid of nervous tissue, an external stimulus radiates or diffuses over the whole mass. Waters poured upon a level plateau cannot choose but spread in all directions, until at length, finding inequalities of surface or of hardness, they flow along the lines of least resistance, and carve out a course from which they cannot afterwards escape. So with animals; if special circumstances determine the stimulus to a particular course, that course may become set, and produce a nerve-fibre. In old times a waggon-wheel was a solid sheet of timber, pierced only for the axle; that was the animal receiving a diffused stimulus without nerve-tissue. The modern wheel with spokes answers to a medusa or a star-fish, with the lines of nerve-fibre radiating to the circumference.

By illustrations from Art and Nature the origin of reflex action, though it cannot be made less wonderful, seems to become more orderly and within our comprehension. The next step, by which these reflex actions give rise to Sensation or Feeling, the passage from Unconscious to Conscious Existence, seems a still higher wonder. But of the wonders of

Nature it would perhaps be right to say that they are all equally wonderful, all alike inexplicable. What we call *explaining* consists in making the mind familiar with a fact, in showing that a fact which is strange to us is like some other fact with which we are acquainted, and in finding stepping-stones to bridge over the interval between facts which in time and place are tied closely together, and yet in thought are separated by what seems an impassable gulf. Such a gulf we seem to have in the passage from the Non-conscious to the Conscious. We are inclined to think that in the history of the world when that passage first occurred it must have been by some special miracle, but in the life of each one of ourselves we know that it occurred without special miraculous intervention. To help us across the wide-seeming gap between unconscious reflex actions and those that have become conscious, it is suggested that under certain conditions the ganglia or groups of nerve-cells do not at once pass on the messages entrusted to them, but have to make a pause, and that pause results in Sensation. It is as if you gave your page-boy a post card to run with to the post, and a block in the road stopped him on his way. While he is delayed he will probably become acquainted with the contents of the post card. The interval, moreover, between Unconsciousness and the first beginnings of Consciousness is probably much smaller than we at first imagine. The first consciousness is likely to have been something very dim, parallel to the information the page-boy will get from his master's post card, if that document happens to be written in Arabic. The first animal that became conscious will not have been surprised with a violent attack of toothache, but more probably with some faintly-uneasy sense of heat or cold, producing the slightest possible shiver, such as a poet might ascribe to a leaf or a rose-bud. Each of my audience understands what is meant by an educated person, because each is personally such a person; but to decide when the title first became applicable would be difficult. The education of the wise is never finished. Since, then, the title applies of necessity to an incomplete stage of acquisition, it needs not to be confined to that high state of culture which induces a man, and fits him, to join the Devonshire Association; it may go back far beyond the day when the child has first been shown a picture-alphabet, and is still supremely indifferent as to whether the letters c—a—t spell *cat* or *dog*. As it is with education, so it is with Consciousness; its earliest state might almost as well be called unconscious as conscious. In creatures without

nerve-fibre there is probably a sort of consciousness, a consciousness half awake or a quarter awake, or a thousandth part awake in a sponge, and a millionth part awake, which comes to nearly the same thing as being fast asleep, in a sensitive-plant. But even in these creatures there is Choice, if we may call that choice which refuses what is bad for the organism and accepts what is good.

Choice may be said to precede Consciousness, but there is one thing that cannot precede it, that was perhaps born with it, that certainly dies with it; the one thing probably amongst all the principalities and powers of Nature to which the human race owes most and which it hates worst. That one thing is Pain. Pain more than anything else prompts men to deny the divine origin of the world. Pain has doubtless been the parent of ten thousand demons, fabulous and imaginary, but none the less horrid, tyrannical, torturers of the soul. It is indeed an enemy so subtle and difficult to avoid that the mere dread of its coming brings it; for the fear of Pain is itself a pain; the dread of its future arrival is in some cases already an unspeakable anguish. But for all this, not only is Pain the guide, philosopher, and friend, without whose invaluable counsels and monitions we could scarcely stir one step with safety in life; not only is it inseparably bound up with the practice of every virtue, and with the training by which men learn the difference between Virtue and Vice, but through the whole course of human evolution it must apparently have exercised a predominating influence, to exalt at every step in the scale of being those who became more and more susceptible to its scourgings.

As far as we can make out, the whole plant world has attained to a vigorous and diversified life without the benefit of Pain. The marvellous processes, the elaborate machinery, the display of what may almost claim to be called choice, purpose, ingenuity, and prudence, in a vegetable cannot be gainsaid; for it is by these that we find plants providing for their growth, their sustenance, their reproduction, their own security against other forces of nature. We lose ourselves in admiration before flowers of Oriental splendour, or the stately trees of the forest; but we are still forced to recognize that, whatever their beauty or grandeur of aspect, the least in the kingdom of the conscious animal world is greater than their greatest and best. It seems likely that this superiority of the animal has been due to the discipline of Pain.

In its earliest lessons Pain will have been concerned in

teaching animals what degrees of heat and cold would be injurious to their welfare, on the very principle which has crystallized into a proverb in these later ages, that the burnt child flies the fire. It is very clear, on the principle of Natural Selection, how sensitiveness to Pain will have been continually developed in the most useful direction. Those creatures which did not shrink from painful sensations attendant upon what was injurious would be liable to extinction. Those which did shrink, and in shrinking made successful efforts to escape both from the pain and the injury, would tend to be preserved; and the more sensitive an organism became, the more would a preserving prudence be developed in it. This may suggest at first thoughts a rather crouching, cowardly sort of world; but it carries with it the promise of something which is essential to the happiness and well-being of humanity, call it by what name you will—Sobriety, Temperance, Moderation.

On the other hand, suppose that the sensation of pain accompanied what was beneficial to the organism. In that case, the creatures which did *not* shrink would have the advantage, and here we seem to detect another group of virtues in their earliest germ—Courage, and Constancy, and Truth.

But besides the self-denial and the heroism, which crown the education that Pain has slowly given to the world, we have to notice two other points in its working: one is, that pain in many cases by endurance ceases to be pain; by the mere fact of being borne it becomes endurable, or even passes over into pleasure. In singing, for example, the early efforts of the learner are exceedingly tiresome to himself. In process of time they entirely cease to be tiresome to him, however they may continue to be so to other people. From another point of view, Pain is like an Eastern monarch, who reserves his most gorgeous present for the moment of parting. Our most exquisite enjoyments depend to a large extent upon contrast. People with nothing to do cannot and do not enjoy a holiday; but they can and do enjoy some unexpected call upon them for exertion, which quickens their pulses and enlivens and invigorates the torpor of their physical, mental, and moral existence. We speak of heaven as rest and peace, because the men who write and preach are worn with the cares of life, whether their own or those of others; they are worn with toils and ambitions, and all sorts of strivings and energizings that fret the puny body to decay, and at last force the unresting mind to wish for nothing more

earnestly than for repose. The children in a school, forced to sit still, and forced to hold their tongues, have little wish for a heaven of rest and peace. They long for a heaven of activity and uproar. Whether the organism wants something that it has not, or wants to be rid of something that it has, when Pain attends the want the organism is powerfully influenced to remove it, and the satisfaction of the want is at once the dispelling of the pain and the production of pleasure.

In the progressive development of the animal world we have to notice not only the birth of Sensation, but the gradual coming to perfection of the different organs of sense. If we suppose all things to have been made just as they now are by a sudden fiat, an almighty word of command, and should then be venturesome enough to compare together two of the divine works, such as the resplendent planet Jupiter, and the eye of a man which can see that planet, we should be prompted, I think, to consider that the eye was a work incomparably more wonderful than the star. Nor do I wish for one moment to lessen the adoring gratitude which we ought to feel for the priceless boon of sight in pointing out that the gift has been one of slow accumulation, passing upwards from a stage when the creature has first that sort of dim sensitiveness to light which belongs to blinded eyes, or eyes that are closed, and eyes still wrapped in slumber. Like the other special organs of sense, so must this of sight, by multitudinous steps of improvement, through ages that we cannot count, at last have become that Gate Beautiful through which Wisdom, rather than by any other entrance, has penetrated into the dark soul of man.

But sensitiveness the most extreme, and organs of sense the most delicate, varied, and ingenious, would have left us still in a helpless and perpetual infancy of the soul, and, as the Egyptian said of the Greeks, with no knowledge of antiquity and no antiquity of knowledge, unless by fresh mysteries of Nature's working Memory had sprung into existence. I speak of Memory as springing into existence to make the contradiction of my own words the more emphatic; for it cannot be too often repeated that nothing *springs* into existence, but rather all things creep and crawl into it, and gradually unfold themselves from Not-being into Being. The memory of a mollusk is very different from that of a senior wrangler; but there is proof that even an oyster can learn

by experience, and there is no experience without memory.* The earliest stage of conscious memory consists, according to Mr. Romanes, in the after-effect when a nerve of sense has been affected by some stimulus, the after-effect, so long as it endures, being carried continuously up to the sensorium.† The next distinguishable stage is that of feeling a present sensation to be like a past sensation. "The past sensation," he says, "has left its record in the nervous tissues of the animal in such wise that when it again occurs it emerges into consciousness as a feeling that is familiar; or if another unlike sensation takes its place, this emerges into consciousness as a feeling that is not familiar." The stages which follow, by which the capacity of the memory is almost indefinitely increased, depend on the association of ideas.

In the present state of the world, if you ask for a general explanation of what it is that makes some men rulers and others servants, of what brings some men to the front in every department of life, and leaves others in the background, it is, in one word, Memory. A powerful memory is a guarantee of success; a weak memory is a perpetual stumbling-block, a source of perplexity and ridicule, a hindrance and a bar to prosperity. Of all culture, the culture of Memory is the most profitable. However it may have come into existence, this faculty is absolutely essential to the happiness of this life and the hopes of another. Without it there can be no permanence of friendship, no keeping of promises, no gratitude. Not only can there be none of these, there can be no continuing sense of personal identity; every moment will be a living death. An eternal life without Memory would only be a fresh beginning at every moment of a creature without a past and without a future, and with about as much capacity for happiness as the spores of a mushroom or the spawn of a vorticella.

We must now, I think, take one of those gigantic leaps which it is agreed that Nature never takes. We must pass over the genealogy of Perception, of Imagination, of Primary instincts, of secondary instincts derived from the lapsing of intelligence, of all the notable beginnings of Reason, to leave room for mentioning the origin of some of those things which are either the foster-brothers or the children of Reason. Which of man's great acquisitions by the help of Reason came first in order of time it may be impossible ever to decide.

* See *Animal Intelligence*, ROMANES, p. 25.

† *Mental Evolution in Animals*, ROMANES, p. 114.

He may have made weapons and tools before he was able to talk. Some philosophers tell us that there is no thought without language, and that, therefore, man could not have become a rational animal until he was able to speak. To this it may be answered that thought must to some extent be independent of language; for why should a word be coined except to express an idea which is waiting for utterance? It is, too, an almost inconceivable wonder if man without thought could invent that which, by taking thought, he is scarcely more able to alter than to add a cubit to his stature. In fact, however, man has had about as much to do with inventing language as with inventing electricity. Though doubtless language has been evolved through the bodily and mental powers of man, it has been evolved like those bodily and mental powers themselves by the slow processes of Nature, and not so that any individual man could claim renown for any of the steps. Prior to the language proper of the tongue there will have been a language of the other features, a language of gesture and grimace. If we may trust the theory of the German author, L. Geiger,* when contortions of the limbs and features, especially violent movements of the eyes and lips and teeth, were accompanied by natural noises, the onlookers, moved more by sympathy with the sights than with the sounds, but at any rate under their combined influence, would utter responsive sounds, destined afterwards to be themselves recalled, and to recall the incidents that had passed when they were first uttered, thus constituting the beginnings of spoken language. It is not difficult to understand that, for example, a smacking of the lips with its attendant sound might become the caveman's signal to the caveman's wife that it was dinner-time, and in those earliest days the sound which in German and English still retains the meaning of taste and flavour would have begun to be applied to food. Possibly too under the same circumstances another use of the word may have had its origin, the naked and hungry young ones being driven away from the food by a sounding smack till the appetite of the tired huntsman had been appeased. Even in these days the vocabulary of an English peasant is said to be extremely limited, and we know how in the mouths of the vulgar one or two adjectives have descended from meanings originally solemn to qualify almost everything that the mouths of the vulgar ever mention; but in the golden age it is probable that a few grunts and growls, or squeaks

* *Ursprung und Entwicklung der Menschlichen Sprache und Vernunft*, von L. GEIGER, vol. i. p. 24.

and whinings, did duty for conversation, and were all-sufficient for the intellectual needs of life. As the tiny ants, without spoken language, have been able to domesticate certain animals, man also may have done as much. If it be really true that some ants sow crops and reap the harvest, man also, even before he acquired speech, may have done as much. Now man as a huntsman must keep his fellows at a distance, but man with flocks and herds can afford to be more sociable; and man with crops of grain will tend to gather in communities. Till these steps have at least begun, it could not possibly be worth the while of Language to develop. Of what service could a large dictionary of words, like Webster's or Richardson's, have been to a limited family, like that of Adam and Eve? A family that lives apart and has no communication with the outer world is sure to be a silent family. In a narrow circle every one soon comes to know his companion's way of looking at things, and there is no need for expression. As iron sharpeneth iron, so doth a man the countenance of his friend. If friction within the man is necessary to engender thought, no less is friction between his mind and others necessary to call forth Language. Just as the great efforts of oratory are only produced under the enthusiasm of sympathy, or amidst the turmoil of opposition and contradiction, while the orator is in fact or in imagination in the presence of numbers, so we may well believe that the first beginnings of Language were due to periods of excitement, and that the natural sounds then uttered would gradually, as men became more gregarious, win upon the attention and the memory, and at last become fixed, to a certain extent, as articulate sounds and intelligible words. But these earliest efforts would only be on a par with the language which a carter uses to his horse. Men of learning are still engaged in the task, which seems almost superhuman, of trying to trace languages back to the primeval roots, to find out how the counters were turned into coin, to discover how they became instruments of thought for the highest processes of inference of which we are now capable. For the name of an object and the vocal sign of an emotion were to lead on by degrees to the power of entertaining and expressing abstract ideas, to the power of expressing and understanding complicated statements, of which the following would be comparatively simple examples: that the product of the sum and difference of any two quantities is equal to the difference of their squares; or, in another sphere of thought, that per-adventure for a righteous man some would even dare to die.

As far as the human mind is concerned, we may even say that the very conception of truth is the offspring of Language, and apparently by no means one of its eldest children. But so complicated a subject is the origin and development of Language that scarcely in any study is it easier than in this for a man to fool himself and others. Nor is it only enquiry into the origin that leads men astray. Marvellous as Language is for its benefits to the human race, having given us about nine-tenths of what makes us human, we have none the less to own that it is very imperfect, very uncertain, very misleading. One word will have many meanings. What a word means at one date will not be its meaning at another. What a word means to the mind of one man will often not be its meaning to the mind of another. And so "we make a man an offender for a word;" and not only individuals, but sects and parties and whole nations, work themselves into almost inexplicable fury over words and statements which none of the combatants really understand, or upon which they are substantially in agreement if only they could penetrate one another's meaning through the fogs and mists of Language.

This instability, this fluidity, at once the virtue and the vice of speech, meets us as an inherent difficulty at every turn when we attempt to feel our way back to the earliest roots of the words we use. During the evolution of Language, there has been an evolution of Society and of Morals as well, and the same word, or derivations from the same root, will have had to express views the most divergent. It is probable, for instance, that man's word for his own body originally meant nothing but *meat*, and that the frame, eventually regarded as made in the likeness of God, was spoken of at first as a tit-bit for the banquet of a cannibal savage. In part we definitely know that what to us is virtuous, to bygone men appeared ridiculous and mean! what *we* think horrible, treacherous, and bloodthirsty, *they* applauded as admirably ingenious and brave, pleasant in the sight of heaven, the exemplary conduct of the heroic and the good.

But if, even as it is, words are so unstable, passing through all sorts of changes, and being put to all sorts of uses, just as if they were so many plants or animals being born, growing up, giving birth to young ones, and dying, what would have happened if Writing had never come into existence? Language without writing would have been so fitful, so unsettled, so like a gibbering ghost, a creature with shape indeed but without solidity, in which your fingers meet when you try to

clasp it, that one can almost imagine the use of it dying out altogether, just as the ingenious atmospheric railway, prepared in this very neighbourhood of South Devon, was given up because the working of it was too troublesome. Writing, then, has been the coadjutor of Language, its invaluable partner, its better half, the containing cup without which the precious wine would have been spilled. No one knows who invented Writing, for the reason that, like Language, it never was invented. It budded forth and blossomed; it came into existence, rather than was created.

In the absence of artificial means, what are the readiest materials for writing? A thorn and your own skin. With these, as we know, Nature, not waiting for a human artist, can make a scratch. That scratch, made accidentally on a man or an animal, was, as some think, the first written mark—the humble birth of Writing. But though Nature or accident engraved the crimson line, it was the mind of man which accepted it as a token. From this acceptance the theory of the learned would lead us on to intentional scratching, to tattooing, to the cutting of marks on trees, impressing them on clay, carving them on rocks. By degrees rough marks give place to pictures, more or less accurately representing objects; and these pictures, still by slow but traceable steps, win their way to alphabetic writing. The pictures *degenerate* into something incalculably more valuable than themselves. It is as if the jewel had actually turned into the grain of corn in Æsop's fable of the hungry fowl. It is only of late years that our own English alphabet has been traced back with anything like conclusiveness to the old Egyptian hieroglyphic pictures. You may read the whole story in Isaac Taylor's clever and learned *History of the Alphabet*, and there be informed that in the upper points of a capital M we still have a right to recognize the two ears of an Egyptian owl, while the sharp angle between them represents its beak.* It was comparatively easy to write the word *mulak*, or owl, by drawing its picture. But if an abstract idea needed expression, though you might have the word, it was by no means easy to draw its portrait. In meeting this difficulty and others, an advance was made of great importance, which led to the use of syllabic writing. In hieroglyphic writing, the symbols represent whole words; in alphabetic writing, the symbols represent only the elementary sounds of the word. Syllabic writing stands in

* *The Alphabet. An Account of the Origin and Development of Letters.* By ISAAC TAYLOR, M.A., LL.D. Vol. i. p. 10.

between, with symbols that represent, as it were, the joints and limbs of the word. Suppose, for example, that with pictures we wished to represent the word "stoppage." The word is made up of two syllables, and if you have imprinted on your memories what was said sometime back about a page with his master's post-card being stopped by a block in the road, you will see how "stop-page" might be represented pictorially. This example may seem grotesque, but it may be supported by a solid precedent. There is an Egyptian word, *khesteb*, which means *lapis lazuli*, a thing very difficult to represent in black and white; but also in Egyptian *khesf* means "stop," and *teb* means "a pig." Hence, according to Dr. Isaac Taylor, in an inscription of Ptolemy XV., at Edfu, *lapis lazuli* is graphically expressed by *stop-pig*, a man stopping a pig by pulling at its tail.

From syllabic to alphabetic writing, the advance was of transcendent value, but one neither easily nor quickly made. The existence in the world at the same time of many different languages is a terrible encumbrance, wasting time, impeding the progress of civilization and knowledge, causing endless misunderstandings in more than one sense of the word; but it has carried with it some very important counterbalancing advantages, and among others probably this, that it led to the substitution, over a large part of the world, of alphabetic for syllabic writing. When men of one language wished to transfer to their own writings, not the meanings but the actual words of another language, as might be the case with the names of persons and places, they found themselves as much at a loss with their syllables as a Frenchman would be who tried to represent our word "stoppage" by any couple of monosyllabic words from his own language. Then came into use the device of employing a syllabic sign to represent only its initial sound. If the man who first hit upon that device could be presumed to have had the dimmest foresight of its value, he might have been regarded as one of the chief founders of literature.

With the introduction of alphabetic writing, not only was the facility for recording facts and thoughts indefinitely increased, but the facility of learning to read the records was vastly augmented likewise. For the general advance of the human race it is not enough that a man here and there should know many things, make great discoveries, have high and noble thoughts. The facts and the thoughts must be put on record. They must not be committed only to a privileged

caste, or made up into the mysteries of an initiated few. To prevent their misuse and degradation, or utter loss, the record must be multiplied, made accessible to the many, given to the world as an abiding possession. The diversity of languages, and the carelessness about popular education, up to, if not within, our own times, have between them cut all men off from some, and some men off from all, of the grand inheritance upon which they might otherwise have entered, of the thoughts of the wise and good of all countries and all ages. Still, in these latter days, for the educated classes at least, the facilities of writing and printing have so grown upon us that, instead of the risk which our ancestors so often ran of being intellectually starved to death, we may rather be compared to that maiden in early Roman history, who was crushed under the golden armlets for which she had herself petitioned. Of making many books there is no end. Neither is there any end to tracing the origins of the innumerable wonders which have grown out of the evolution of human thought and language and writing, continually separating man by a wider and wider interval from the lower animal creation.

But while in this endless pursuit some lines of investigation seem useful and legitimate, seem to gratify a lawful and laudable curiosity, there are some which to some minds seem only shocking and irreverent. To Horace it seemed profane that man should have invented ships to cross the ocean placed by the Divine Will to keep continents asunder. How much more profane does it seem to many that man should venture across what they think the boundless ocean that separates Mind and Matter, and trace back to an origin, in nerveless protoplasm, the conscience and the religion of mankind. We are ever on the look out for an infallible guide, and, as far as morals are concerned, in Conscience many persons think that they have one. If they read Mr. Galton's *Inquiries into Human Faculty*, they will find out their mistake. In the consciences of individuals and of nations may often lie embalmed the sins and iniquities of forgotten ancestors. It is likely enough the young and impetuous will argue from this that, Conscience being fallible, imperfect, itself not free from flaw and stain of crime and untruth, they need not, they had better not, pay heed to its admonitions. But in sober reality a hasty conclusion like this is only on a par with those unpractical jests, those views inconsistent with common-sense, which are only taken up or uttered in some moment of distaste with the world in general

or our own affairs in particular—when a man will say that food would be wholesome and palatable but for the cooks, that all men would be peaceable and honest if there were no lawyers, that we should live long and healthy lives if the physicians would leave us alone, and that there would be no superstition, fanaticism, and bigotry, but for us clergy. There is a little spice of sarcastic truth in all these monstrous accusations, which scarcely prevents one misanthrope in a million of men from having recourse to the cook and the cleric, the lawyer and the leech, according as he is hungry in body, or sick at heart, in trouble with his neighbours, or a victim to disease and pain. The great trades and professions retain their hold upon mankind, not because they do all things well, but because they do the things which cannot be left undone; and in like manner Conscience is a reigning prince of high power and virtue, indispensable to the welfare of the world, which cannot be discrowned or dethroned, however we may find that it is an earthly and fallible, rather than a divinely perfect, sovereign.

Of the origin of Religion, must not one word in conclusion be said, seeing that without it all in the past seems unmeaning and worthless, all in the future nothing but Tartarean gloom? It is easy to close the question by saying that Religion owes its origin to inspiration; but no one is ready to define what is meant by inspiration, and the scientific enquirer is apt to maintain that what men call inspired, is strictly limited to those parts of the books deemed sacred, which happen to agree with the worshipper's own opinion of what is right and good. All the rest is not only not divine, it does not even rise to the level of common-sense, meaning always by common-sense the uncommon astuteness which the worshippers themselves possess. It is tolerably clear that at least in their contradictory details all the religions of the world cannot be true together; yet we never hear of any one of them proclaiming, "Blessed is he who discovers and makes known any blemish or error in this system or creed." They think that Religion must be divinely infallible, or that it can have no authority at all. Selfishness indeed is always on the look out for a chance of being selfish without restraint, and that chance seems to be given if the sanction of absolute certainty is removed from what once was regarded as a voice from heaven.

It is no profanity to say that the art and science of the surgeon and physician have had an origin and development,

during the times of history. It is, I think, in these days some compensation for the tortures of disease that they bring us acquainted with a combination, in the person of the general practitioner, of eminent skill, of tender kindness, of unquestioning self-sacrifice. The theories on which these men act are in many respects divergent; they are none of them infallible or perfected; there is abundance of ignorance, and error, and mischance mingled with the skill and knowledge. By feeling our way back to the roots of the science, we come upon all sorts of vagaries and superstitions—demonology and witchcraft, prescriptions bound upon the sore or swallowed by the patient, sick men tied to trees to have their diseases flogged out of them, live spiders rolled up in butter to cure the jaundice, with many other pleasing devices scarcely yet extinct, that have come down to us from the brave days of old.*

If then from the midst of folly, cruelty, and error, Medicine has slowly won its way to the dignity of a great science, which is constantly widening its beneficial influence and gathering surer knowledge of the truth, need we despair or despond because Religion, like all other things that are human, seems to have been created, and to have had a beginning; that is, to have been slowly evoked by Natural selection, so that as a rule the best and noblest and worthiest to live of the sentiments of mankind are still surviving, and ever more and more prevailing, though not yet to the utter destruction and extinction of all sentiments that are mean, degenerate, and unworthy?

By contrast with the Past we may think ourselves happy and blessed, and this unearned increment of time accrues to us without any injury to the bygone links of our ancestry; for the Past could never at any stage think itself miserable by contrast with the inconceivable superiority of the Future. That things hereafter, whether in this world or another, whether in ourselves or in our successors and representatives, shall be infinitely higher and grander in intellect and morals than anything to which we have attained, is to us no cause for mean envy and jealousy, but only a noble and inspiring hope. As we look back upon the whole course of Evolution it seems to tend continuously upwards; as we look back upon ideas of Religion long antecedent to our own age, and find the shepherd boy as he watches his sheep in the wilderness coming to the grand, but after all simple and natural conclusion, "The Lord is *my* Shepherd," we can scarcely help

* See *Folk-Medicine*, by WILLIAM GEORGE BLACK, *passim*.

thinking that not without God would such an idea have ever been educed ; that not without Divine guiding and prompting throughout could protoplasm ever have evolved the conception that the daily progress of this life brings the pilgrim, not continually nearer to decay and nothingness, but "a day's march nearer home"—a home in the bosom of God. We are brought back, whether we will or not, with logic or without it, to an Origin of all origins—the source whence and the end whither of all things, a central, all-embracing, nothing-neglecting Unity of love and power—whose we are, and whom we serve, for we are also His children ; and looking down the long line of the world's history, with all we know, or think we know, of what is actual and what is possible, of what the Past reveals and the Future promises, regarding all the evil and the good, the wonders of Nature, and the sorrows as well as the blessings of our own lives, we may still say, with the voice of the ancient poet, "Whoso is wise and will observe these things, even they shall understand the loving-kindness of the Lord."

Obituary Notices.

COMPILED BY THE REV. W. HARPLEY, HON. SEC. OF THE ASSOCIATION.

(Read at Newton Abbot, July, 1884.)

I.

E. ARTHUR, in his early years, settled in a portion of the Australian continent, being one of the earliest settlers in the part. He afterwards practised as a solicitor in Bombay, in which place he served as coroner. In later years he came to reside at Slade, near Kingsbridge, and became interested in public matters in the neighbourhood; but did not take a very active part in them. He was one of the trustees under the will of Mr. Duncombe, and as such, under the old scheme, was a governor of Kingsbridge Grammar School.

He married the daughter of the late Captain Wells, of Slade, who survives him, and by whom he leaves two children, a son and a daughter. His character has been summed up in the three words—genial, good-hearted, and straightforward. He was elected a member of the Association in 1877, at Kingsbridge, and zealously aided in rendering the meeting there so eminently successful. He died suddenly, on Sept. 30th, 1883, at his residence, aged about 65.

II.

HENRY ANSON CARTWRIGHT was the third son of William Cartwright, of Brimley House, Teignmouth, by his wife Mary Cole, daughter of William Anson, of Radcliffe, in Middlesex. He was born on Christmas-eve, 1803. He was educated under Dr. Lempriere, author of the well-known *Classical Dictionary*, first at Exeter School, and afterwards as a private pupil at Shaldon House. From Dr. Lempriere's care he proceeded to Edinburgh; and after having studied in London and

Paris he settled at Torquay in the medical profession, at first as a general practitioner, and afterwards as a physician. In 1842 he entirely resigned the practice of his profession, and went to reside at Forde House, near Newton Abbot. In 1844 he became High Sheriff of the county, and continued an active magistrate until a short period before his death, when increasing infirmities compelled him to relinquish active duties.

He was twice married, first to Harriet, second daughter of John Watson, of Hamilton Square, Birkenhead, by whom he had one son, the Rev. Anson William Henry Cartwright, of Brimley House, Teignmouth; and secondly to Frances Catherine, second daughter of Isaac Minet, of Baldwyns Park, Kent, who survives him, and by whom he leaves seven children, the eldest of whom is a major in the Northamptonshire Regiment. Mr. Cartwright joined the Association in 1881. He died in March 1884.

III.

R. P. CHAPLIN was born at Colchester, Essex, in 1818. He entered the Customs in 1837, but in 1838 was transferred to the Admiralty, Somerset House, where he remained until 1855, when he received the appointment of Accountant at Portsmouth Dockyard, whence he was transferred in the same capacity to Woolwich. He returned to the Admiralty as a first-class clerk about 1861 or 1862. In 1868 he received the appointment of Accountant in Devonport Dockyard, whence he retired in 1870. He was much respected in the service for the thorough manner in which he performed all his duties.

On his retirement he took up his residence at Torquay, and occupied himself in microscopic investigations.

He became a member of the Torquay Natural History Society in 1870, and was elected a Vice-President of that body in 1875.

He joined the Association in 1877, and died at his residence, Earham, Torquay, on December 27th, 1883, aged about 65 years.

IV.

H. W. FARLEY during the latter years of his life practised as a civil engineer and surveyor at Exeter, where he died on 14th August, 1883. He joined the Association during the Dartmouth Meeting, in 1869, being then resident at Kingswear. He became a life member in 1878.

V.

P. B. GLUBB was for a long time resident at Torrington, and became a member of the Association in 1875, on the occasion of the meeting in that town. He never attended any subsequent meeting, nor did he contribute a paper, but always welcomed the publication of the annual volume of *Transactions*, which, as he said, he read with pleasure and profit to himself.

He died at Torrington in September, 1882.

VI.

FREDERICK GREEN was born at Saffron Waldon, in Essex, on the 30th November, 1845, was educated at University College, London, and took his M.A. degree at London University in 1867. An accident while riding compelled him to pass some time in the South of Europe. Having sufficiently recovered he entered at the Inner Temple, was called to the Bar in 1869, and for some time practised in Lincoln's Inn as an equity draftsman and conveyancer. In 1877 increasing delicacy of the lungs, consequent on an attack of scarlatina some years previous, obliged him again to seek a warmer climate, and he went to South Africa. He returned to England, however, the following year, with evidence that his health was seriously impaired, and that he must finally sacrifice his prospects at the Bar in London. After this he took up his residence at Exmouth, intending to practise in Exeter and its neighbourhood.

Had the disease been permanently checked, there is no doubt that this experiment would have been successful; for while work was sent by old London clients, Mr. Green made professional acquaintances in the West. But it was not long before he found that practice in the courts, and even regular attendance at chambers in Exeter, were out of his power. For a time indeed the tubercular affection appeared to be stationary, but there was a constant though very gradual loss of strength. To the last Mr. Green kept at work. Within twenty hours of his death he was dictating the draft of a deed, and after the doctor, being called in on the appearance of unusual symptoms, had pronounced that life was all but run out, Mr. Green completed the task upon which he was engaged, and gave his wife full directions as to the arrangement and disposal of his client's papers.

But it was not only in the practice of his profession that Mr. Green's attainments as a lawyer were shown. When in

London he was for some time on the staff of the *Weekly Reporter*, and from that time to the end he was an occasional and valued contributor of reviews and essays on legal subjects to the *Solicitor's Journal*. He was also greatly interested in the researches of Sir Henry Mayne and other students in antiquarian and comparative law, and contributed more than one thoughtful article on the subject to contemporary periodicals. A valuable summary of the law relating to land, from the point of view of a land-surveyor, which will be found appended to Curtis's *Estate Management*, is from Mr. Green's pen, as was also a series of articles giving a popular view of the land laws, which appeared not long since in the columns of the *Daily Western Times*.

Most of the time not consumed by professional work was, however, devoted by him to labours still more directly beneficial to the community. He threw himself heartily into every public movement at Exmouth.

During the early days of his abode there a remark fell from his lips which sufficiently well indicates his character. Realizing the truth, that whether he succumbed to the malady from which he was suffering, or whether he might recover, his residence at Exmouth would be of a temporary character, he said, "I cannot expect to be here long, but I like to act as though I had the prospect of a long life in Exmouth, and I mean to throw myself with all the energy I possess into the attempt to promote the prosperity of the town; any good fruit that may result I shall not be here to gather, but the ingathering of the harvest will gladden the hearts of others." He ever afterwards bravely acted up to the spirit of these words.

He initiated a Society for the relief of the necessitous poor in Withycombe, a parochial organization intended to check the pauperizing tendencies of indiscriminate almsgiving, while at the same time bringing judicious assistance to those to whom it is really beneficial. For some time he acted as Secretary to the Society, and was to a great extent responsible for its success. He was warmly interested in the proposal to erect a new church, in the populous quarter of Exmouth belonging to Withycombe parish. He was also a zealous though open-minded and tolerant politician, and was mainly instrumental in organizing the Exmouth Liberal Association. As a platform speaker, both on political and general topics, he achieved a marked success, his terse arguments and never-failing humour delighting the audience; while his voice, to the wonder of his friends, even when the disease was in its

last stages, filled the hall or assembly rooms without effort on the part of the speaker.

But it was to those who knew him personally, and especially to his intimate friends, that the rich variety of Mr. Green's character was best known. To great intellectual power he united singular warmth of heart and breadth of sympathy. Nothing human was strange to him. No good trait of character, no beauty of scene, no charm of manner ever lacked his appreciation; he had a fervour of admiration for what was high-minded and noble, whether in word or deed. Over all played the bright ray of his genial humour, never unkind, always wholesome, sunny, and refreshing.

He became a member of the Association in 1881, and gave the meeting at Exmouth his hearty support.

He died at Exmouth in December 9th, 1883, in the thirty-ninth year of his age, leaving a widow, two sons, and a daughter.

VII.

JOHN TAPLEY HARVEY was the son of Mr. Jacob T. Harvey, who came to Torquay early in the present century. Mr. Jacob Harvey was an enterprising man, and he heartily entered into the scheme of the late Sir Lawrence Vaughan Palk for developing what at that time was the germ of the town. There was a row of houses on the Strand, and a view of Torquay, as it then existed, shows that there was not a single shop among them. Mr. Jacob Harvey and his sons built Vaughan Parade, Beacon Terrace, Higher Terrace, Park Crescent, and a portion of Park Place. Mr. J. T. Harvey and his brother William afterwards built Hesketh Crescent, Upton Church, the Torbay Hotel, and several of the finest villa residences in the town.

Mr. Harvey was elected a Town Commissioner in 1839, and continued in that capacity until the adoption of the Public Health Act in 1850, when he was elected a member of the Local Board of Health, on which he served up to the year 1872, when he retired on the expiration of his term of office. He also represented the parish as Guardian of the Poor for a great many years, and was for a long time architect to the Torwood Manor. He had a great aptitude for business, and on all questions appertaining to matters of local interest his opinion carried great weight. In politics he was a Conservative, and worked actively for his party.

He became a member of the Torquay Natural History Society in 1872. He joined this Association in 1873, when he at once

became a life member ; and he was one of the Vice-Presidents at his decease. He rarely was absent from the annual meetings, and his pleasant smile and hearty shake of the hand will be missed by many who knew him well.

For some years past his health had greatly failed ; and although he rallied for a time, he finally succumbed, and died at his residence, Aberfeldie, Torquay, on Wednesday, the 16th January, 1884, at the age of 69.

VIII.

JOHN MANLEY HAWKER, M.A., Prebendary and Treasurer of Exeter Cathedral, was the eldest son of the late Mr. William Hawker, of Plymouth, and was born at Plymouth, 5th May, 1820. He was educated first at Plymouth and Ottery Grammar Schools, and afterwards at Winchester, where Dr. Moberly, the present Bishop of Salisbury, was then head-master. He graduated at Balliol College, Oxford, taking his Bachelor's degree as a third class in *Literæ Humaniores* in 1842, and proceeding to M.A. in due course. He was ordained deacon in 1844 by Dr. Allen, Bishop of Ely, and admitted into priest's orders in the following year by Dr. Denison, Bishop of Salisbury. Between the years 1844 and 1856 he held successively the curacy of Brownstone, near Modbury, the incumbency of Tipton St. John, and the curacies of Horly and Arley. In 1856 he was instituted to the Rectory of Ideford, near Chudleigh, which he held till 1871, when he was appointed vicar of Ide, near Exeter. In the same year he became Prebendary and Treasurer of Exeter Cathedral ; and since 1876 he held the rectory of Berrynarbor, to which he was presented by the Bishop of the diocese.

As might have been expected in one so genial and so versatile, Mr. Hawker formed at college many life-long friendships. Prominent among those whose acquaintance he made at Oxford, and who remained his valued friends up to the day of his death, were the present Bishop of Exeter, Lord Chief Justice Coleridge, and Mr. Matthew Arnold.

Treasurer Hawker took the deepest interest in all matters archæological, and he was a keen lover and observer of Nature. He was one of the original members of the Teign Naturalists' Field Club, and until his removal to North Devon one of the most frequent attenders of its meetings. His sprightly conversation added greatly to the pleasures of the excursions of the club, and his more formal contributions read at the meetings were always sources of attraction. These latter com-

prised a paper descriptive of Lidwell and various localities near Dawlish (1861); a paper relating to Chudleigh (1862); a sketch of Bishopsteignton, describing the church and the ruins of the Episcopal Chapel at Radway (1867); and a paper tracing the progress of Newton Abbot and Newton Bushel (1873). He had always the interest of this club at heart, and to his aid and energy in its early days much of its success is to be attributed.

For upwards of ten years Mr. Hawker favoured the Torquay Natural History Society with an almost annual lecture, his subjects being as follow: "The Pleasantness of Social Life;" "Things convenient in Social Life;" "Things helpful in Social Life;" "What is Poetry?" "Peter Pindar;" "Cheerfulness;" "A Plea for Mediocrity;" "Early Associations;" "Surprises;" "English Manners and Customs during the Reign of Queen Elizabeth." The subjects help to show the character of his mind. He was elected an honorary member of the society on 30th May, 1877.

Mr. Hawker became a member of this Association in 1869; thenceforward till his decease he was never absent from its annual meetings, and perhaps at none of the many gatherings at which the Treasurer was an ever-welcome and prominent feature will his kindly presence be more missed, than at the annual meeting of this Association. He undertook the task of reading year by year the series of Reports prepared by the Committee on Devonshire Celebrities, and many pleasant memories will be recalled by his own contributions at successive meetings on "John Prideaux, Bishop of Manchester;" "Wolcot, otherwise known as Peter Pindar;" "Miles Coverdale;" "Bishop Jewel's Birthplace;" "The Manor House, Berry Narbor;" "Clotted Cream;" "The Devonshire Farm Labourer now and Eighty Years Ago;" and "Devonshire Cider." He was one of the Vice-Presidents of the Association in 1872, and again in the years 1874, 1877, and 1879. In 1876 he was President. As a member of the Council, he was a most regular attendant at the meetings, and he served on several of the committees for special purposes.

In Exeter, where he was well known, he was highly popular, and he had the sympathy of clergy and laymen of every religious denomination. He was not only an accomplished scholar, but an eloquent preacher, and a pleasing platform speaker. He took a deep interest in the promotion of science and art. At Ilfracombe he addressed the students of the science and art classes on several occasions; at the Plymouth Mechanics' Institution, three years ago, he lectured most

interestingly on "Painting;" and he frequently lectured to the artisans employed on the railway works at Newton Abbot.

Treasurer Hawker was a man whose sympathies embraced all classes, and he was popular in every rank of society. To sit near him at a dinner-table was to ensure enjoyment; for he possessed a rich store of anecdotes, and told them well. Alike in pulpit, on the platform, and in social life, he was honoured and beloved; a perfect type, in mind and presence, of an English gentleman. No one could know him long without loving him. As a testimony to his worth, the words of two of his life-long friends may be aptly quoted. Lord Chief Justice Coleridge says of him: "To me the loss is irreparable—quite. At my age I cannot have a friendship again of forty-five years, and at no age is such a friend as he was easy to obtain. He deserved all the love I could give him, and I thank God that (I hope, at least) he knew how much that was." The Bishop of Exeter, in a sermon, preached in the Cathedral on the Sunday following the Treasurer's death, on purity of heart, said: "The deceased, at any rate, was one of those who had many of the marks of that purity of heart of which I am preaching. I do not know that I have ever been acquainted with a man who had in him so much of that perpetual kindness of heart and those other indications which show that the soul of man is bent on the service of the Lord. It seemed as if, beyond anything else, that which occupied his mind was how to do kindnesses to other people. It pleased God to visit him with a severe affliction. After living a happy life of sixty years and more, never having suffered much pain during that long period, it pleased God that at last he should suffer great agony. He suffered very severe agony for weeks and weeks, and those who were with him never heard him utter an impatient word, never heard him say a single unkind thing; and when I last saw him there was on his face a sorrowing smile of absolute peace, indicating that he had given himself to God with his whole heart. He was a man not likely to be soon forgotten by those who knew him."

He died 5th June, 1884.

IX.

NICHOLAS SAMUEL HEINEKEN came of a clever family in Germany, amongst the different members of which were the skilled musician and Capel Meister Johann David Heinecken, author of a very curious work in German, entitled, *Der General Bass in der Composition, order neue und gründliche*

Anweisung, &c., 1728; and the Baron Charles Henry Heinecken, author of an equally curious and interesting work in French, known as *Idée Generale d'une Collection complète d'Etampes, &c.*, 1771; also Christian Henry Heinecken, "The Wonderful Boy of Lubec," and some others.

The grandfather of the subject of this memoir was the first who came to England; he had been a merchant at Bremen, and when established in London and the neighbourhood, realised a large fortune by a well-conducted business, and by importing Baltic and other timber for the use of the English Navy; and, being thus possessed of ample means, either he, or his son, or both, lived for a time at the mansion house of Poles, in Hertfordshire.

Some of his relatives also came to England about the same time. In the *London Magazine* for 1772, among the deaths, the following occurs: June 26th, Dr. Herman Heineken Physician to the City of London Lying-in Hospital." His will is preserved in the Will Office, at Somerset House; and one of his executors is a cousin, called William Heineken, who lived at Chelsea, and who is appointed trustee or guardian to his daughter, who appears to have been an only child. Among the marriages in the same magazine this notice may be observed: "August 29th, Dr. Monro, Physician to St. George's Hospital, to Miss Heineken, of Pall Mall." From the circumstance that this lady married a gentleman of the same profession and status as the above-mentioned, it may be inferred that she was the person mentioned in the will. As no descendants of the same family name have since been heard of, it is presumed that they have died out, at all events in the male line.

The son of this first arrival was a man of education and of cultivated taste, much given to reading, if we may judge by the numerous works on art, science, theology, voyages, travels, and poetry, which he had collected about him. He lived for some time at Bolling Hall, an old gothic mansion near Bradford, which suffered considerably in the siege of that town during the period of the Civil Wars; and whilst residing there he was the minister of the Unitarian Chapel at that place. He died August 25th, 1840, and of his seven or eight children three only attained maturity; namely, Christian, the eldest, a doctor of medicine, who, during the last nine years of his life, lived and followed his profession in the island of Madeira, where he eventually died unmarried;* secondly, the subject of this notice; and thirdly, a daughter,

* *Chambers's Miscellany*, No. 64, vol. vii.

who married William Horfall, Esq., of Hornby Grange, near Northallerton, in the county of York.

Nicholas Samuel, of whom we now speak, was born at Brentford on the 5th of July, in the year 1800; and having received the usual rudiments of education, he was sent for preparation for the Unitarian ministry to what was then "York," now "Manchester New" College, on the foundation, in the city of York, where he was a fellow-student with Hamilton Rowan, Edward Strutt (afterwards Lord Belper), and some others, whose names in aftertimes have made a noise in the world. Having a great passion for music, he turned his attention to the organ, looking upon that instrument as the most comprehensive embodiment of musical mechanism that man's ingenuity had ever produced. This taste led him repeatedly into York Minster, where he quickly formed an acquaintance with the organist, and soon after with the organ itself, his knowledge as a player, and his turn for mechanics, rendering it quite safe in his hands. It was at this time that he seems to have conceived the idea of a different principle of reed stop, now known as the "free reed." The reed of the clarionet, of the trumpet-stop, and of some others in the organ, and in the common penny whistle used by children, and it may also be added in the buzzing whistle that may be made with a penknife out of a straw, or stalk of corn—in all these cases lies on a plate or flat surface of wood or metal, with a hole under it smaller than the reed which covers it, so that this elastic reed or tongue slaps or strikes the flat surface in its vibrations; but Mr. Heinekin's plan advocated a reed smaller than the hole or slit, instead of larger, and which had just room enough to vibrate freely inside it, with a small space all round, except at one end, where it was fastened. By this construction a new quality of tone was produced. So much was the organist taken with the idea, that he had a pipe, or a series of pipes, comprising a complete stop, made upon this principle; but being a novelty, and not having been put out of hand with sufficient care, the experiment did not answer the expectation, and the matter dropped, or fell temporarily into abeyance.

Some time after he had completed his education he removed to Devonshire, and made the acquaintance of the Rev. M. L. Yeates, who was appointed minister of the Old Presbyterian or Unitarian Meeting House at Sidmouth in 1821, to which chapel Mr. Heineken was himself appointed in 1825, and held it till 1830. In 1830 he married Miss Emma Yeates, only child of that gentleman. She died young at Cullompton,

leaving an only daughter, named Emma Yeates Heineken. In 1835 Mr. Heineken was again appointed to the chapel at Sidmouth, and continued there until 1840, when he resigned, and devoted all his leisure afterwards to the pursuits of music, mechanics, and the sciences.

His daughter, Miss Heineken, married the Rev. J. B. Lloyd, who had been minister of the same chapel at Sidmouth, but subsequently of Wareham, and since then of Knutsford, in Cheshire.

His ruling passion was music, which he cultivated theoretically and practically with steady perseverance, until the infirmities of age weakened his hand. Being a good mechanic, he made his own double-bass, or "big fiddle," as it is popularly called, a very fair toned instrument, on which he played at the concerts of the Oratorio Society in Exeter, and at other concerts elsewhere. At the private meetings in Sidmouth he frequently took a part on the violoncello. He again turned his attention to the "free reed," and he subsequently had an organ in his drawing-room, which facilitated his inclination to study the stops. He took a piece of brass plate as thick as a penny, and cut a hole in it six-tenths of an inch long, and one-tenth wide, and fixed a flexible brass tongue at one end, small enough just to vibrate freely inside the hole. The current of air should be directed down upon it, so as to blow the tongue into the hole, and then the tone is produced. This was a small beginning; but he afterwards proceeded to construct an instrument of several octaves, having a manual of black and white keys like the pianoforte, bellows, and treadles complete. The whole of the metal work was accomplished with his own hands—a most laborious undertaking. He made no secret of his inventions; so far from that, he generally communicated his new contrivances to the public, by writing full descriptions, and sending them to the popular journals and magazines of the day. We believe we are right in saying that this seraphine, as he called it, was the parent of the accordion, and of the harmonium of a later day; and it is certain that many ingenious contrivances, which have from time to time been brought out as original by mechanics, manufacturers, and others, were in reality his inventions, taken wholly, or sometimes modified, from the pages of these prints.*

It was during the earlier portion of his life that he com-

* In the *Musical World* for June 3, 1838, vol. xxiv. p. 343, there is a full account of the free reed, communicated by Mr. Heineken only a few weeks before his death.

posed six original psalm tunes, arranged in full score for four voices and the organ, a first edition of which was printed at the time, and a second subsequently in Exeter. They were adapted to words by several authors. Late in life he printed extracts from *Der General Bass*, and other old writers, for distribution among private friends, in order to perpetuate the excellencies of some of the early masters.

He also made the brass excentric chuck of his lathe, as well as many of his tools, by which he accomplished a variety of beautiful effects in ornamentation. Not the least of the several ingenious contrivances attained by his lathe was a plan for copying medallions, effected by means of a bent lever, one end of which passed over the surface of the object to be copied as a "feeler," while the other was armed with a fine cutting tool, directed against a block or disc of hard wood, out of which, by this means, a facsimile of the medallion was produced. Equally an enthusiast in telescopes, he directed his hand to grinding and polishing the lenses, which he made out of selected specimens of thick plate glass; and having thus made himself practically acquainted with the construction of the most commonly-used spy-glass, he next proceeded to the reflecting telescope. He made at least two: the first of small size, but the second had a four-inch reflector. He cast the speculum metal himself, ground and polished the reflector, and mounted it in its tube on a tripod. It produced a very clear image, and was certainly a great achievement for an amateur. His performances in electrotyping, gilding and silvering in the battery, photographing, or dialing, cannot have more than a passing notice here; and though sedulously followed, they frequently gave way to the attractive studies of geology and archæology.

He joined the Devonshire Association at the Honiton meeting in 1868; and although he did not contribute to the *Transactions*, beyond recording facts for some of the committees, he took an ardent interest in the good work promoted by its members, and felt that but for their industry an immense body of valuable information concerning various parts of the county would have been utterly lost to the use of future generations, though now by their care preserved.

He believed himself to be the last of his name in England. In the month of June, 1883, he suffered from a bilious attack; and although he never gained sufficient strength afterwards to leave his room, there was every appearance of ultimate recovery. In the latter part of August, however, he was taken

with occasional fainting fits, and he succumbed to one of them on the 25th of that month, having attained the age of 83 years and 51 days.*

X.

BENJAMIN TERRY HODGE, M.R.C.S., and a Licentiate of the Royal College of Physicians, was the representative in the third generation of a race of influential medical practitioners in Sidmouth. In the time of the grandfather, at the commencement of the present century, that watering-place was rising into repute as a health resort for the invalid, and it reached its height of fashion and fame on the arrival of their Royal Highnesses the Duke and Duchess of Kent, on the 24th of December, 1819, with the infant Princess Victoria, then seven months old, and now her present majesty. Mr. Hodge, the grandfather, had a brother, who was a surgeon at Ottery. The father, who stood in the place of the second generation, whose practice extended beyond the town of Sidmouth over a large area in the neighbourhood, is still remembered by many of the older inhabitants. He left two sons, both brought up to the medical profession, and a daughter, who married Mr. Bath.

Benjamin, the subject of the present memoir, went through the usual course of studies with credit and success. He graduated at London University, and on returning and settling in his native town, the practice at one period was carried on simultaneously with his brother, but eventually he became the sole medical representative of his family. He married, firstly, Miss Hare, who gave him one daughter, who survives him; and, secondly, he married Mrs. Phillips. He was thoroughly devoted to his profession, and pursued it as a scientific study, upon the higher and nobler grounds of investigation into the obscure but important laws that regulate health on the one hand, and disease on the other, thereby reducing those pursuits to the principles of a cherished science. With this constitution of mind, and with a deep knowledge of the anatomy of the human frame, he became a skilful operator; and being a man of great nerve, he performed many difficult and dangerous operations with entire success. Though occasionally somewhat abrupt in his manner, he had the welfare of his patients entirely at heart; and as a medical man attached to the Dispensary in the town, he was much loved by the poor who resorted to him

* This and the following note were kindly contributed by Mr. P. O. Hutchinson.

for advice, whereby many acts of kindness and generosity to them are current amongst those who now regret his loss. In his hours of relaxation he was fond of sport with the rod and the gun, so that when he could get relief from the duties of his profession he was a zealous and an active sportsman.

He was an advanced Mason; the study of the craft he followed up with his characteristic ardour; and so great was his knowledge of the Order of the Temple, and so extensive his research, that he was appointed one of the six of the chivalric Christian Order to revise and rewrite the ritual for the ceremonies and for the services. By His Royal Highness the Prince of Wales he was appointed a K.C.T., or Knight Commander of the Temple.

He died at Sidmouth on the 20th of September, 1883, and was interred on the 24th in the family vault, on the north side of the tower of the parish church, when an amount of sympathy was manifested by such a numerous attendance as was never witnessed in Sidmouth before.

He joined the Association in 1873.

XI.

ROBERT HURRELL was born at Salcombe, in the year 1808. For many years he practised as a solicitor, first at Modbury, and afterwards at Kingsbridge, and was also associated with Mr. G. B. Lidstone in the management of the Kingsbridge Joint-Stock Bank, which was subsequently merged in the West of England Bank. His position thus as solicitor and banker, as well as his connection with the various public bodies and institutions of the town, brought him into close daily intercourse with all classes of persons, and this was of a free, familiar, and helpful character. He was one of the representatives of Kingsbridge on the Board of Guardians, and as Chairman of the Assessment Committee of that Board his services were of inestimable value. In his position as Chairman of the Feoffees of the town lands, his judgment and penetration were of great service to the interests of the town; and by his long and varied experience in commercial matters, he manifested in every other office he held a correctness of judgment which often proved most valuable in dealing with the interests of those about him. For many years he represented Kingsbridge on the Highway Board, of which he became Chairman; but increasing infirmities necessitated his withdrawal from that body. He was also one of the Directors of the Kingsbridge Gas Company, which he assisted to establish so far back as 1835; and in many

other respects he proved himself an active and useful citizen, and was at all times desirous of promoting in every way the welfare of the town and neighbourhood. Mr. Hurrell was President of the Kingsbridge Literary and Scientific Institution, and, chiefly through his action, one of the most successful meetings of this Association was held in that town in 1877, when, in his capacity as representative of the Literary Institute, he cordially welcomed the Association in the name of the town. He became a member of the Association the same year, and filled the office of a Vice-President.

He died at his residence, The Knowle, Kingsbridge, July 31st, 1883.

XII.

WILLIAM LAIDLAY was born in London on the 14th of February, 1821, and was educated at St. Andrew's, N.B. From thence he went to St. John's College, Cambridge, and took his B.A. degree in 1846, in which year he was ordained, by the then Bishop of Durham, to the curacy of Fleetwood, Lancashire. In 1848 he was presented to the living of Madehurst, Sussex, by John Abel Smith, Esq., M.P. for Chichester; but was obliged to resign it in 1861 in consequence of the insufficient accommodation of the vicarage.

Mr. Laidlay in 1862 accepted the curacy of St. James, Clapham; and on the death of his incumbent, in 1865, he moved to Stokefleming, near Dartmouth, and became known as a preacher in many of the villages round.

In 1871 he was appointed to the vicarage of West Teignmouth; but his health failing, he was compelled to resign his charge in 1876. On removing to Hertfordshire his lost strength was in some measure restored, but for a brief period only; and after a long and distressing illness he was taken to his rest on the 27th October, 1883, at the age of 62.

Mr. Laidlay was a member of the Evangelical party of the Church of England. He was an *extempore* preacher of no mean powers; and many of his hearers will never forget the eloquent words which fell from his lips. But it was chiefly his large sympathy and his unfailing kindness and courtesy that endeared him to his people. Beloved by rich and poor, by Churchmen and Nonconformists, his name will long be remembered with affection by those among whom he ministered.

He joined the Association in 1869, and was a life member.

XIII.

W. LINFORD was elected a member of the Association in 1872. He spent his life from boyhood in the City Bank, Exeter. His chief interest was centred in geological researches. He was the author of a paper "On the Budleigh Salterton Pebbles," in 1870; and in 1872 he wrote a paper "On Quarries at Beer, in Devonshire, and some of their Fossils." These were both read to the Geological Society of Edinburgh, and were published in the second volume of the *Transactions* of that body.

In private life Mr. Linford was as gentle and kind to all as it was possible to be. A more kind-hearted man it would be difficult to find. He died June 28th, 1884, at his residence, Elstow, Tiverton Road, Exeter, aged 78.

XIV.

WILLIAM BOWER SCOTT was born July 14th, 1807. He was the son of Vice-Admiral Scott, who resided and died at Scotleigh House. He was greatly respected by the inhabitants of Chudleigh, and his memory will be long cherished in their minds for his many public acts and private benevolences. He felt a deep interest in everything connected with the place.

Mr. Scott was an ardent student of ornithology, ichthyology, and other branches of natural history, and had made a large and valuable collection of stuffed birds. He was one of the founders of the Teign Naturalists' Field Club in 1859, and continued to be a zealous supporter of that society. In 1860 he read a paper "On the Ornithology of Devon" to the Club. In 1873 he was elected Vice-President of the Club, and in the following year he was promoted to the office of President, and again in 1875 discharged the duties of Vice-President. He also read several papers "On Salmon and Salmon Fishing."

In 1865 he became a member of this Association, and while his health was good he was rarely absent from the annual meetings. He read a paper on "Salmon Passes," in 1874, to the meeting at Teignmouth.

Mr. Scott also became a member of the British Association in 1869.

About a week before his death, whilst on a visit to Teignmouth, he broke the small bone of his leg. Hopes were entertained of his recovery, but he passed away suddenly on the morning of Thursday, May 29th, 1884, at his residence at Chudleigh.

XV.

RICHARD WHITE was born January 6th, 1810, and was for about forty years connected with Her Majesty's Customs at Looe, in Cornwall, and at Barnstaple, the greater part of the time as Comptroller, and subsequently as Collector. Ten or fifteen years ago he removed to Instow. He lived a quiet, uneventful life, highly respected by those who knew him.

He joined the Association in 1867, and died at his residence, The Bungalow, Instow, on 25th June, 1884, aged 74.

XVI.

CHARLES WILLIAM WOOD, Q.C., was the ninth son of the late Mr. John Wood, of Kennington, and was born at Henrietta Street, Covent Garden, on the 7th of May, 1813. At an early age he was apprenticed to a firm of wholesale druggists in Lower Thames Street. When his apprenticeship expired he went to St. John's College, Cambridge, and afterwards to Peterhouse, where he obtained his B.A. degree. He then practised as a special pleader for three years, but was called to the Bar at Lincoln's Inn on the 14th June, 1843. In 1852 he came into prominence as a very sound lawyer, with special knowledge of ecclesiastical laws, by the indictment he drew up for the Government against the late Cardinal Nicholas Wiseman, when the latter assumed the title of Archbishop of Westminster. This, however, was not proceeded with.

By far the greater portion of the well-known book entitled, *Petersdorff's Abridgement of the Common Statute Law*, was compiled by Mr. Wood. He was employed more than once by the proprietors of magazines, against whom Mr. Bradlaugh brought actions for libel, and was the first to sustain an objection to the customary oath being administered to that gentleman.

Mr. Wood was also specially employed in compensation cases for accidents, and was considered a clever and painstaking lawyer in cross-examination, his opponents not unfrequently complimenting him for his courtesy. He went on the late Home Circuit, and never practised in the criminal courts.

In January, 1872, he was appointed Queen's Counsel, and made a Bencher of Lincoln's Inn. Whilst a junior he was standing counsel to the London and South Western Railway Company, and conducted some important cases against Messrs. Pickford and Co., the well-known carriers. In 1873 he appeared as leader in the first case tried by the New Railway Commissioners, appointed under Chichester Fortescue's Act

of 1873; viz., that of *Goddard v. South Western Railway Company*. This case lasted some days, and, as the *Times* stated, "raised points of very great and general importance as to the carriage of goods by railway, and concerned chiefly the private carriers of the United Kingdom."

In 1876 he retired from active life, but was always ready to assist his neighbours, both in North Wales and Devonshire, either with sound legal advice in private, or an amusing or interesting lecture in public. He was noted as a reader, and was a thorough master of that very uncommon gift; few public readers have excelled him. He was three times married—in 1842, 1851, and to his wife Frances (*née* Crombie) in 1870, who, however, did not long survive her husband. She died at Paignton, June 17th, 1884.

Mr. Wood became a member of the Torquay Natural History Society in 1881; on 12th February, 1883, he delivered a very admirable lecture on Alexandria before that body; and at the time of his decease he had engaged to lecture on Francis Bacon before the same Society.

He took great pleasure in the progress of science as well as in the society of scientific men, and often regretted that his professional avocations had prevented his undertaking original researches.

He joined the Association in 1881, but was prevented by the state of his health from attending an annual meeting. He was greatly interested in the annual volume of *Transactions*.

He died at his residence, Hill Side, Paignton, from internal cancer, on January 13th, 1884. His remains were interred in the presence of the leading gentry and tradesmen of the neighbourhood, by whom he was much liked and respected, at the New Cemetery, Paignton.

NINTH REPORT OF THE COMMITTEE ON SCIENTIFIC MEMORANDA.

NINTH REPORT of the Committee—consisting of Mr. George Doe, Rev. W. Harpley, Mr. H. S. Gill, Mr. E. Parfitt, and Mr. J. Brooking Rowe—for the purpose of noting the discovery or occurrence of such facts in any department of scientific inquiry, and connected with Devonshire, as it may be desirable to place upon permanent record, but which may not be of sufficient importance in themselves to form the subjects of separate papers.

Edited by J. BROOKING ROWE, Hon. Secretary of the Committee.

(Read at Newton Abbot, July, 1884.)

THE Committee beg to submit their Annual Report. The communications, although not numerous, are valuable. The Committee much regret the loss of one of their number, Mr. N. S. Heineken, whose communications were always of value and interest.

R. N. WORTH, Chairman.

J. BROOKING ROWE, Hon. Sec.

June 19th, 1884.

I. ZOOLOGICAL.

MAMMALIA.

“Bottlenose, or Pilot Whale (*Globicephalus melas*). Found in a dead or dying state on a reef of rocks called Hook Ebb, east of Sidmouth, after a severe gale between the 11th and 14th February, 1883. A full account will be found in the *Zoologist*, 1883, p. 173. (W. S. M. D’URBAN.)”

“Dolphin (*Delphinus delphis*). Plymouth, 13th September, 1883. (J. GATCOMBE.)”

AVES.

The following birds have been noticed by various observers :

"Iceland Gull (*Larus leucopterus*). Plymouth Sound,
January 25th, 1883. (J. GATCOMBE.)"

"Pomatorhine Skua (*Stercorarius pomatorhinus*). On the
Exe, November, 1882. (W. S. M. D'URBAN.)"

Rough-legged Buzzard (*Archibuteo lagopus*). Lustleigh,
March 28th, 1883.

"Nutcracker (*Nucifraga caryocatactes*). Huntshaw Woods,
near Bideford, 14th July, 1883. About two years ago Mr.
C. F. Hinchliff observed a bird of this species at Instow.
"(M. H. ROTHERAM.)"

"Hoopoe (*Upupa epops*). Near Plymouth, 19th April,
1883. (J. GATCOMBE.)"

"Spoonbill (*Platalea leucorodia*). Near Plymouth, Novem-
ber, 1883. (THOMAS CORNISH.)"

PISCES.

"Wolf Fish (*Anarrhichas lupus*). Teignmouth, 20th
March, 1883. (W. S. M. D'URBAN.)"

"Tunny (*Orcynus thymnus*). From the Exe, 14th Sept.,
1883. (W. S. M. D'URBAN.)"

"Great Sunfish (*Orthogoriscus truncatus*). Observed off Dart-
mouth and Exmouth, June, 1883. (W. S. M. D'URBAN.)"

"Thresher (*Squalus vulpes*). Exmouth, 13th September,
1883. (W. S. M. D'URBAN.)"

"Blue Shark (*Squalus glaucus*). Plymouth, 12th Sept.,
1883. (J. GATCOMBE.)"

"Thresher (*Squalus vulpes*). Plymouth, 13th Sept., 1883.
"(J. GATCOMBE.)"

ARTICULATA.

Mr. Parfitt reports the capture of an insect new to England,
the beautiful *Thais polyxena*, a European butterfly. Mr.
Parfitt says that it was brought to him soon after it was
caught, and is in very good condition ; it had apparently only

just escaped from the pupa, as the hind wings were not quite extended. "I have, however, pressed them down on the setting board, so that it now presents a respectable appearance." It was captured by two boys near the city of Exeter on April 27th.

II. BOTANICAL.

"A horse-chestnut tree at Topsham in the early part of September, 1883, shed all its leaves, and in the early part of October it burst out again into almost full leaf and flower. The flower spikes had grown, when a branch was brought to me, four inches in length; and the leaves had so far developed, that the middle lobes were four and a half inches in length, the whole having a vigorous and healthy appearance. October 28th a branch was brought me in full leaf and flower. The flowers were fully developed, and full-coloured; the spike about six inches long. The leaves had now begun to show signs of decay, as they were more or less spotted with brown. Nothing, so far as I can ascertain, had been done to the tree to bring about this abnormal growth.

"(EDWARD PARFITT.)"

III. PETROLOGY.

TROWLESWORTHITE.

"It will be desirable to put upon record in the *Transactions of the Devon Association* the discovery of a new rock in Devonshire, which has been named by me, from the place of its occurrence, Trowlesworthite. It was found by myself in August last on the north-western flank of Trowlesworthy Tor, near Cadover Bridge; and is only known to be represented by one loose block. There can be little doubt, however, that this boulder was derived from a vein traversing the granite, but hidden by the turf. While so far, therefore, like the well-known Luxulyanite, which it somewhat resembles, it has not been found *in situ*, I have some hopes ere long to be able to detect its actual position. The resemblance to Luxulyanite consists in its being mainly composed of tourmaline and felspar; but the difference is even more material—the presence of violet fluor spar. Moreover, the felspar, flesh-colour in Luxulyanite, in Trowlesworthite is rich red; and this, contrasting with the soft velvety-black of the tourmaline, and the deep purple of the fluor, makes Trowlesworthite a rock of rare and singular beauty.

"The Rev. Professor Bonney, F.R.S., President of the Geological Society, has made an exhaustive microscopic analysis

both of the Trowlesworthite and of the normal granite of Trowlesworthy Tor, and has come to the conclusion that the former has been formed from the latter by the following mineral changes: (1) Replacement of the mica by brownish tourmaline; (2) replacement of some portion of the felspar by acicular greenish-black tourmaline and quartz; (3) replacement of the original quartz by fluor spar. Of this last change no instance had previously been recorded. Professor Bonney's detailed description of the structure of the Trowlesworthite is as follows:

"This very beautiful rock is rather coarsely crystalline, as is usual with the granite of Devon and Cornwall, and consists of red felspar, apparently orthoclase, dull green patches of schorl [Professor Bonney uses this name throughout for the black or dark green acicular variety of tourmaline], and purple fluor spar, with an occasional grain of quartz. The felspar is rather the most abundant mineral. Of the other two constituents, the fluor slightly predominates over the schorl; and, on examination with a lens, the latter appears often to border the former, and, when it occurs in larger patches, to be an aggregate of minute crystals associated with some other mineral. Under the microscope the felspar is seen to be rather decomposed, much stained with ferrite, containing numerous secondary microliths, some being tourmaline, the last often being associated with little patches of clear quartz. The tourmaline occurs, as in Luxulyanite, in two forms. 1. A moderate-sized grain of brown tourmaline, with a border of black dust mingled with a dark blue mineral, and a little quartz in minute crystals. This brown tourmaline contains several small enclosures. Several of these appear to be empty cavities; but in one is a small bubble, which does not appear to move. 2. Very numerous acicular crystallites of dull olive-green or slightly brownish green-grey tourmaline [schorl], sometimes about $\frac{1}{10}$ " long, generally less. These are strongly dichroic, being a pale olive-brown when the optic axis of the crystallite is parallel to the vibration plane of the lower nicol (the analyser being removed); but when it is at right angles, a dark greenish-grey, approaching black. This schorl is more abundant on the edges of the decomposed felspar crystals, growing from them like a grass, and is sometimes associated there with opacite and ferrite, so as to form an almost opaque mass. Many of the crystallites are elongated prisms, terminated by faces of R or $\frac{1}{2}$ R. They are associated either with quartz or fluor, into which they pierce, and through which they are scattered. The quartz

is in moderate-sized granules, and is generally free from inclusions, cavities included. A speck of ferrite or a cavity, measuring about $\cdot 0008$ of an inch, with a bubble about $\frac{1}{2}$ of its volume, occasionally occurs. The crystallites of schorl not seldom pierce it without interruption from grain to grain. The fluor shows a distinct octahedral cleavage, and is slightly stained with ferrite. Cavities are fairly abundant. They vary considerably in size, often ranging from about $\cdot 001$ of an inch downwards, but sometimes exceeding the former magnitude. They are rather variable in form, and commonly contain bubbles. These vary much in size; not seldom, however, they occupy about one-sixth of the cavity.'

"Professor Bonney also observes that the habits of the tourmaline in Trowlesworthite are exactly such as he has described in the case of Luxulyanite, and fully confirm his views as to the origin of that rock.

"I may add that specimens have been deposited in the British Museum, and in the museums of the Geological Society, Jermyn Street, South Kensington, Canterbury, Exeter, Torquay, Plymouth, Truro, and Penzance. All petrologists who have seen the rock recognise its distinctive character, and as such its title to a separate name and classification.

(R. N. WORTH.)"

IV. NUMISMATICAL.

"A third bronze coin of the Emperor Probus, in a good state of preservation, was found in April by a lad while digging a cricket pitch in the Devonport Park. It was about a foot from the present surface; but as from time to time considerable changes have been made here, and the level of the ground was formerly irregular, this is no indication of the depth at which it may have been originally lying; for very many years the Park, formerly known as the Brickfield, has been in pasture. The coin bears on the obverse the head of the Emperor to the right, crowned, and the legend, 'IMP C PROBVS . P . F . AVG;' and on the reverse a figure of Peace, with an olive-branch, IIII. underneath, and the words, 'PAX AVG.' So far as I am aware, this is the first coin of Probus that has been found in the vicinity of Plymouth, the Roman coins previously recorded by me being—Hadrian, Antoninus Pius, Alexander Severus, and Faustina. It is the first Roman coin of any description from Devonport. Coins of Probus have, however, been found at Exeter, Haldon, and Kingskerswell, and probably elsewhere in Devon.

"(R. N. WORTH.)"

"Only one Seventeenth Century Devon Token hitherto unknown to the writer, has been acquired by him since our last meeting, from an unexpected quarter; viz., from the collection of a gentleman living near Cambridge. It is a brass Dartmouth farthing, reading—

"Obv. 'ELIZABETH. WIKS.—E.W.'

"Rev. 'AT. DARTMOTH' (*sic*), in three lines across the field.
" (H. S. GILL.)"

"Small silver coin, worn, and wanting great part of outer circle, by which legend is cut off.

"Obv. King seated, folds of drapery down below knees; full face, high up, crown in outer circle reaching to the edge; sceptre surmounted by a cross in right hand, another similar by right side.

"Legend nearly all cut off, or worn off. What remains may read—'GRA. REX. ANG.'

"Rev. Shield with France and England quarterly, divided by long cross to outer edge. Two keys below shield; no data. Legend begins with C, probably for CIVITAS, but the rest illegible. A hole has been driven through the margin for suspension.

"Size 3, Mion.; present weight, 10 grs.

"Dug up at Sidmouth, in April, 1884.

" (P. O. HUTCHINSON.)"

V. ARCHÆOLOGICAL.

Bronze and other relics found on Torr Estate, near Plymouth.

"In the early part of this year, when some of Mr. Thomas Hosken's men were removing an old hedge forming part of the boundary of Torr Lane, in the parish of Pennycross, or Western Peverell, they found three bronze implements—two of these are what are called paalstaves, one of which is a very perfect specimen of this kind of axe, and could have been but little used; the other but a portion of a similar instrument. The third is a celt or battle-axe head, which has a square socket, into which a wooden handle was fixed. Not far from these interesting remains of a long bygone age the workmen found about thirty-six coins, mostly copper. One is supposed to be of Roman date, but is too much worn to be clearly identified. A good authority who has examined them pronounces them to be of only the value of old copper, with four exceptions:

"Two old penny-pieces.

"One shilling of George II.

"One twopenny-piece of Charles II.

"In the same hedge, and near the same spot, were found four iron shot, about $2\frac{1}{4}$ inches in diameter, and several leaden pistol bullets, together with some clay tobacco-pipes. These are relics and dispersed remains of the siege of Plymouth during the Civil War, in the 17th century. The bronze axe-heads and coins are now in the possession of Richard Hall Clarke, Esq., of Bridwell, near Collumpton.

"(JOHN WHITMARSH.)"

Mr. Francis Brent reports the discovery of a sword found in the churchyard of Ermington, South Devon, deposited upon a coffin. "The blade is 2ft. 1in. in length, allowing for a small portion that has been recently broken off the point; it is $1\frac{1}{2}$ in. broad at the middle, and about a quarter of an inch thick at the back. It has a graceful curve from the hilt to the point. The hilt, from the insertion of the blade to the end, is $4\frac{1}{2}$ inches long, and is composed of two pieces of wood, fastened together through the iron prong of the blade by means of studs. It has a curved knot at the extreme end to prevent the weapon slipping out of the hand of the holder. The hilt is bound with two bands of embossed brass, and a band of the same material passes round the woodwork at the insertion of the blade. A strip of brass is carried along the back of the sword for about five inches, and might once have been longer, as a portion appears to have broken off, and the base of the blade is ornamented with two triangular pieces of embossed brass, once probably gilt, the design of which is extremely elegant. Near the end of the hilt a number of little silver pins have been driven into the wood on each side, the object of which, in addition to that of ornament, would appear to be to give a firmer hold to the hand. These pins, however, are also inserted over the extreme end of the hilt. On each side have been seven, or probably nine, circular ornaments. Some of these have come out, and are lost; but the few remaining enable it to be perceived that they consisted of small pieces of ivory or bone inserted in a circular recess, bordered with a rim of silver or gold wire. The ornament itself is formed of six lozenge-shaped pieces, each divided by means of silver wire, with smaller pieces of ivory inserted to fill up the spaces and complete the circle. The blade is much rusted, and is broken at the tip; whilst some of the wood composing the hilt has been broken off and lost, and with it some of the ivory circular ornaments and silver pins. But considering that this elegant knife or sword may have been buried for a considerable time, it is

otherwise in a fair state of preservation. From the character of the ornamentation a competent antiquary has pronounced the weapon to be Saracenic. What connection its owner could have had with Ermington is a mystery."

VI. SEISMOLOGY.

The following extracts from newspapers with reference to the earthquake of the 25th June, 1883, may be useful in preserving a record of the extent of the disturbance.

From the *Western Morning News*, of the 26th June, 1883: "Rarely as this country is visited by earthquake, it is a still more rare occurrence for the shocks, when they do come to this favoured land, to be felt in the south-western peninsula. This especial immunity was, however, broken yesterday for the first time for many years. From time to time there have been rumours and alarms created by lively imaginations, and having little, if any, foundation in fact, but yesterday the east of Cornwall and west of Devon were visited by a veritable earthquake, and great and natural alarm was the result, although, happily, no damage whatever was done. Our correspondents differ somewhat as to the direction of the shocks; but it would seem that, striking the southern coast of Cornwall, they travelled in a north-easterly direction, and affected a large area, extending, at the least, from Lostwithiel on the west, to Ashburton on the east, and from the English to the Bristol Channel. The whole valley of the Tamar lay in their path, but the Three Towns seem to have been outside it.* The duration of shock differs considerably in the accounts of our correspondents, periods of time varying from three seconds to half-a-minute being mentioned as its length by different observers. There is this peculiarity also, that whilst correspondents at Lostwithiel and Liskeard speak only of one shock, reports from places to the eastward state that there were two distinct shocks, with an interval of half an hour between them. The first of these was the more severe. It occurred at about a quarter to two in the afternoon, and was preceded by a loud rumbling noise, similar to that made by a heavily-laden waggon passing over a hard, rough road. Then came a tremor which made walls shake, articles hanging from the ceiling and walls oscillate, and people generally

* This was not so. In my office in Mulgrave Street, Plymouth, a heavy iron safe shook—not to say rocked—perceptibly.—J. B. R.

become alarmed. Following we give communications received from some of our correspondents :

" At Lydford and Tavistock the shocks were distinctly felt ; and at Dunridge, Horrabridge, about 2.15 p.m., says a correspondent, the earthquake made the windows and fire-irons rattle, accompanied with a rumbling noise, similar to a heavy waggon passing over a paved street.

" An earthquake shock was felt in the neighbourhood of Ashburton about 2 o'clock. At Halshanger House and the cottages at Langworthy Brook, a little below Halshanger, the chinaware was distinctly shaken. The shock, which lasted about half a minute, was also felt at Landscope, where residents describe the noise as similar to that of a roller passing along the highway.

" At Okehampton, about two p.m., a number of the inhabitants were startled for a time by what appeared to them to be shocks of earthquake. The houses were observed to rock, and the shaking of chairs, plants, earthenware, and anything pending was distinctly visible. The noise which accompanied it resembled that of the rumbling of a heavy waggon when moving at a short distance, and several people came out to see whether any such conveyance was near ; but there was none visible. The occurrence was more particularly observed in the northern and southern parts of the town.

" Our Holsworthy correspondent says : A slight shock of earthquake was felt here about 1.36 p.m. It appeared to take a direction of from south-west to north-east, the shock lasting two or three seconds, and was accompanied by a peculiar rumbling noise. It was felt on the south and north-western side of the town more particularly. The atmosphere was very close and the air oppressive at the time, the wind being due west, and dark clouds appeared to be hanging about. Rain fell during the whole of the morning. A rumble was again heard just after two o'clock, which was thought to be thunder. Excitement and consternation prevailed in the town at the time, the people rushing from their houses into the street and talking in excited groups. The tins, glasses, &c., rattled, and furniture oscillated in nearly every house. In a draper's shop a pile of carpets rocked. The houses shook to their foundations.

" What is generally supposed to have been a slight shock of earthquake, writes our Bideford correspondent, was experienced at Bideford and in the surrounding neighbourhood at about 1.30 p.m. A rumbling noise was heard, accompanied

by a vibration, which in some cases seems to have been very distinct, and to have caused wonder and even alarm. Around Hartland, Clovelly, and Buckland Brewer the shock was generally felt, and a telegram reached Bideford from the former place in the afternoon, stating that a comparatively severe shock had been experienced. At Clovelly a gentleman who was writing was unable to proceed through the vibration. At Buckland Brewer the Bideford postman, who was standing near a cupboard, was much surprised at the rattling of the china and similar contents of the cupboard. At Wooda Wharf, Bideford, the shock is reported to have been sufficient to cause a perceptible jingle among the house-bells at the residence of the manager, and the accountant in the office adjoining went to the door to ascertain the cause of the unusual rattling of the roof. A man had to hold on to some railings at East-the-Water. The rumbling noise was very generally heard; and the vibration, in many instances similar to the above, was very pronounced, and caused no little wonder and inquiry. The unusual occurrence was the theme of general conversation throughout the town last evening.

On the following day further reports were given in the same newspaper:

"The shocks of earthquake which, as reported yesterday, occurred on Monday afternoon in many places in Devon and Cornwall, were felt even more generally than was at first stated. It was yesterday believed that the phenomena had not been experienced in the Three Towns, but subsequent inquiries show that quite the contrary is the case. At Mutley, Stonehouse, Stoke, and the Great Western Docks, at least, one of the two shocks was felt. A resident in Admiralty Street, Stonehouse, says that he was on Monday lying ill in bed, and that about two o'clock in the afternoon the bed was violently shaken, and the house trembled throughout. There was 'the usual rumble of an earthquake shock.' The writer's wife was quite alarmed. He thinks the duration of the trembling was about five seconds. Our correspondent adds: 'I recognised the visitor at once, I having for many years resided in Japan, where earthquake shocks are frequent.'

"Two shocks, says a Lydford correspondent, occurred there on Monday afternoon, one at 1.35 p.m., the other at 2.5 p.m.

"The Rev. W. Y. Drake writes from Bridestowe Rectory, South Devon: Shortly before two o'clock on Monday, what

would seem to have been a slight shock of earthquake took place here. Those who felt it assert that they heard a loud rumbling noise beneath the feet, which shook the windows and house itself; the leaves were also noticed to tremble violently. This strange phenomena was also observed by Mr. S. C. Hamlyn, of Leawood, which place is a quarter of a mile distant from this house.

"The Rev. J. Sellicks, Newton Abbot, says: I distinctly felt the shock of earthquake here at 1.39 p.m. I was sitting in my study, and being somewhat 'Mondayish,' after an unusually hard day's work on Sunday, was feeling drowsy, but was thoroughly aroused, and for a moment alarmed, by the violent vibration that passed through the house. The motion, or tremor, reminded one of the effect produced by a heavy man standing in the centre of the floor of a large upstairs room in a house 'built to be sold,' and 'trying' it with all his weight, four or five times in rapid succession. I at once thought of earthquake, and was not at all surprised to see the reports in your issue of this morning.

"A sharp shock of earthquake, reports our correspondent, was felt at Ilfracombe and the neighbourhood. Many houses in the lower part of the town were violently shaken, windows rattled, and ornaments on the chimney-piece fell to the ground. At the adjacent villages of Lee and Morthoe much alarm was occasioned the inhabitants. In some places the shock was so forcible that several young women, who were passing through the latter village, had to lean against the walls by the side of a street to prevent their falling to the ground."

A North Devon paper gives additional information :

"From Ilfracombe and Southmolton reports from our correspondents say the shock was felt by several persons, and was accompanied by a sound as of distant thunder or of heavily-laden carts travelling over the street.

"It is beyond doubt that the shock of earthquake was distinctly felt in North Devon on Monday in various localities. The experience of those who felt it was in most cases alike, namely, that of a rumbling noise and a shaking of doors and windows. A gardener at Tapely Court, Instow, says he was sitting at dinner with his wife and children, when suddenly there was a noise like thunder, and the doors and windows shook a good deal. His wife was frightened, and dropped her knife and fork; but he pacified her by saying it was thunder.

He, however, felt convinced it was something more than that, and went into Tapely House, and found that it had been felt there. Mr. Christie, however, who was walking in the grounds, did not hear anything. At Bradiford, in the borough of Barnstaple, the noise and the house-shaking are stated to have been distinctly heard and felt by several persons. At Clovelly the shock seemed to be more severe, for in some houses the chimney ornaments were knocked down. Hartland and Bideford were also visited. At Instow many people felt the shock. One young man rushed into a house to see what had fallen there, thinking something had happened indoors, while one of the inmates looked out of the window to discover what was the matter out of doors. All seemed to have been mystified by the shock, and many very much frightened."

The following is from the *Devon and Exeter Gazette* :—

"A shock of earthquake was felt at Exeter between one and two o'clock on Monday afternoon. It would be more accurate to describe the 'shock' as a series of shocks; for the tremulousness of the earth lasted for something like three or four seconds, and consisted of ten or a dozen reverberations. The sensation, to a person who happened to be laid on the flat of his back, was somewhat alarming, and the motion was like that caused by dragging a very large piece of furniture along the floor, or the passage of a heavy luggage-train. This occurred at about 1.38 p.m.

"At Okehampton the phenomenon was distinctly felt. A correspondent states the time as about a quarter to two o'clock. Windows and chairs were shaken, and the tremulous motion appeared to pass along from Belston, taking a direction from east to west. In the signal-box near the Okehampton Railway-station, and at the residence of Mr. Symington, the shock was unmistakably felt and its effects were heard. There was another shock at about 2.15 p.m., described as 'a rumbling which resembled the passing of a very large railway waggon.' Some people declared that they could discern a subterranean roaring sound.

"A correspondent says that a slight shock of earthquake, which appeared to be travelling in the direction of north-west from south-east, was felt in Tavistock at twenty minutes to two on Monday afternoon.

"A telegram from Launceston reported that a shock, apparently of earthquake, was felt there at twenty minutes to two, accompanied by a rumbling noise, lasting about thirty

seconds. Houses shook and crockery rattled. A second slight shock was felt about an hour later.

"Our Bude correspondent, writing on Monday, says: At 1.45 p.m. to-day a very extraordinary vibration was experienced here and along the coast. The shock was quick and sharp; but sufficient in force to shake the houses to their foundations, and cause a sensible oscillation of furniture in rooms; and such articles as crockery, glass, &c., to shake and rattle with the movements. I can only compare the sensation to the shock which accompanies the booming of heavy artillery, the sound which accompanied the vibration being of the same character. It was felt by nearly everyone in the place. No damage was done, but in many cases people came from their houses to ask each other the meaning of the strange phenomenon.

"A shock, as of earthquake, was distinctly and generally felt at Stratton on Monday afternoon at 1.42.

"Several slight shocks of earthquake were distinctly felt at Bideford and throughout the neighbourhood on Monday afternoon, at about half-past one o'clock. A correspondent, living near the river, informs us that he heard what appeared to be three shocks of earthquake; the first taking place about 1.25. The first shock was indicated by a slight shaking of the bells in the house; and the second, about five minutes later, in the same manner, but not quite so distinct. Within five minutes, however, a violent shaking of the windows and doors was noticed, and the whole house was shaken. The last shock was distinctly heard and noticed by several persons on both sides of the river, and we are also informed that it was heard at Monkleigh. One man, whilst standing outside his house, saw the ground heave all round, and he heard the windows of his house rattling. A second man, to whom he was talking at the time, was obliged to catch hold of the garden railings to prevent himself falling.

"The shocks were felt with special distinctness at Hartland and Buckland.

"An Ashburton correspondent writes: The shock of earthquake was distinctly felt here on Monday, at about two p.m. At Bowdley Farm a labourer, named H. Gill, was having a nap in the barn during his dinner hour. The shock rolled an empty barrel standing on its end in the barn against Gill, and awoke him. A person in Ashburton felt a sofa that she was sitting on shake.

"At 1.40 p.m. on Monday the neighbourhood of Holsworthy was alarmed by hearing, as was thought, some large building

fall, but the sound proved to be that of a slight earthquake. A rumbling noise proceeded from under the earth, every house seemed to tremble, earthenware upon the shelves rattled, and some fell to the ground, horses broke from their stalls by breaking the halters, and cattle ran in all directions. The phenomenon only lasted a few seconds.

"The Rev. F. Gilbert White writes from Leusden Vicarage: The two earthquake shocks were very distinctly heard on Monday, the first about 1.40 and the other at 2.15 p.m. It seemed to us at first like a large carriage coming rapidly along the drive which lies above the house. The rolling sound as of thunder was clearly heard, as well as the clatter of china, &c., on the mantelpiece; then came the tremor under our feet. The second shock was weaker. I am told that at Ashburton, five miles distant, the phenomenon was hardly noticed."

The *St. James's Gazette* had as follows: "Some unpleasant vibrations of the earth took place on Monday, at Bude and other places. Houses were shaken, bottles and small articles rattled on shelves, and the symptoms were decidedly those of an earthquake. Fortunately there seems to have been no serious destruction of property; and as earthquakes are not frequent in England, and seldom do much harm when they come, there is no occasion for panic. It is, however, well to bear in mind that we stand in a more perilous position as regards earthquakes than did our ancestors. The flimsy houses constructed by 'jerry builders' during the last few years are utterly unfit to cope with terrestrial convulsions of any description. They can hardly withstand the force of a gale of wind, and the shock of a very mild earthquake would bring them down by thousands. It was not always thus with English houses. In 1101, according to William of Malmesbury, England was terrified 'with a horrid spectacle; for all the buildings were lifted up and then again settled as before.' Some little anxiety was natural under the circumstances; but as all ended well, the fright was soon over. Far different would be the fate of our modern buildings in the event of their being 'lifted up' by an earthquake; even if they 'settled as before' their case would be bad enough, for many of them are only propped up by each other and rest on no solid foundation; but there cannot be a doubt that when hoisted in this fashion they would fall to bits like a pack of cards, and it is therefore hoped that we are not on the eve of an earthquake season."

"To the Editor of the Exeter and Plymouth Gazette.

"Sir,—To-day, about 1.30, as I was sitting quietly in an armchair reading to my wife, who is ill in bed, we experienced a most severe shock of earthquake, which was accompanied by a loud rumbling noise. I have always been rather sceptical about these things before, as I have never experienced any shock till to-day; but there was no doubt about this. The whole house was shaken, and the bed on which my wife was lying and the armchair on which I was sitting, most perceptibly moved. My wife was frightened, and could not think what it was. The house was very quiet at the time, and there was not a sound out of doors; it was as still as it could be. I immediately went round the house, and asked if the other inmates had experienced it. The governess and the children, who were in the room below, had heard the noise and felt the shaking, and were much frightened. The men out of doors felt and heard nothing. The shock seemed to me to go from north to south.

"Believe me, yours faithfully,

"N. W. EDWARDS.

"Dowland Vicarage, North Devon, June 25th, 1883."

"To the Editor of the Exeter and Plymouth Gazette.

"Sir,—For the next two or three days I shall look into your paper with much curiosity, in the hope of seeing accounts from various observers, of their experience of the phenomenon which gave some of us at Widecombe a pretty considerable scare yesterday. It may probably interest you and your readers to know what our experience of it was. A little after one p.m., standing near the entrance-door of this vicarage, I heard a long-rolling rumble towards the south, which reminded me of a distant thunder-clap; but although the atmosphere was rather sultry, yet there was no other indication of thunder, and I set down the noise therefore to the firing of a big gun at Plymouth; for the sound of these Plymouth guns not unfrequently does the service of reminding one, amid the solitudes of the Moor, that there is such a thing beyond our tors as an outside world.

"No more was thought of this distant sound till about a quarter of an hour afterwards, when suddenly, without notice, there came, as though starting from close by, a tremendous growl or heavy threatening rumble, which lasted with increasing force about a dozen seconds, dying away gradually

during another dozen probably. What could it be? It was not thunder; it was too low down for that.

"My first impression was that something wrong had occurred in the house, and that by some carelessness or other a heavy piece of furniture had been brought down. My next, that some solid vehicle, conveying a dignitary of the Church, was coming in at the gate—the Bishop, perhaps, come to look his remotest clergy up, and strengthen their orthodoxy on the subject of the Deceased Wife's Sister Bill! We know how stalwart the Bishops were in opposition, and how stern their defence before royalty in the House of Lords. The supposition, therefore was not so insane as it looks. But no. After putting my head out of the window to catch the sight of panting steeds and cumbrous chariot, all in vain, I was satisfied that we had been honoured by the presence of a visitor as rare as an episcopal one—a singular natural phenomenon! At the moment I was not aware that it was a genuine earthquake; for I had felt no vibrations other than those cardiac vibrations which are the natural consequences of a sudden apprehension of an impending face-to-face meeting with one's bishop. I quickly learnt, however, that several of my parishioners, who were placed more exactly in the line of direction, had been very much scared; indeed, had felt the floors 'quiver-like,' had seen 'the cloam' dance on the dresser, and kettles jump on the hob, and had themselves (as an old Cornishman said) 'dringen away to their doors as fast as they could, all maze, sure enough.'

"Such is our experience of yesterday's phenomenon. I hope others may give you theirs after a more scientific fashion.—Yours truly,

J. WILLIAMS.

"Widcombe Vicarage, June 26th, 1883."

SEVENTH REPORT OF
THE COMMITTEE ON DEVONSHIRE VERBAL
PROVINCIALISMS.

SEVENTH REPORT *of the Committee—consisting of Mr. J. S. Amery, Mr. G. Doe, Mr. R. Dymond, Mr. F. T. Elworthy, Mr. F. H. Firth (Secretary), Mr. P. O. Hutchinson, Mr. P. Q. Karkeek, and Dr. W. C. Lake—for the purpose of noting and recording the existing use of any Verbal Provincialisms in Devonshire, in either written or spoken language, not included in the lists published in the Transactions of the Association.*

Edited by F. T. ELWORTHY, Member of Council of the Philological Society.

(Read at Newton Abbot, July, 1884.)

THE best possible proof that your Committee can offer of the attention they have bestowed upon their subject, and of the continued interest taken in it by members of the Association, is to be found in the largely-increased number of provincial words and phrases which it is their pleasure to be able to present in this, their Seventh Report.

The objects of the Committee seem now to be more widely understood, and they have to express their thanks to several fresh contributors, one of whom has supplied a large and valuable list. At the same time it must be fully borne in mind that the demand for new contributions needs to be annually repeated, and your Committee, while tendering its thanks for favours received, trusts that its old supporters will not relax their own observations, and at the same time that they will use their best endeavours to increase the number of contributors, as well as to extend the interest and sympathy which after all has but just begun to be awakened in the subject.

Although a loving notice is sure to find a place in that of another Committee, yet in this Report there is a contribution from one whose signature will bring home to us the fact that his labours are ended ; from one whose loss this Committee cannot pass over without the expression of their deep sorrow that his genial face will no more be seen at our meetings, rendering grace and piquancy to his delightful papers.

RESOLUTIONS.

At the Meeting of the Association, held at Exmouth in 1883, it was ordered that the following resolutions and suggestions should be printed annually for the benefit of new members :

1. That the members of this Committee be requested to observe the following regulations, with a view to uniformity of action :—

(A) To regard the following as Devonshire Provincialisms, if used by a speaker or writer within Devonshire, irrespective of their being, or not being, used elsewhere :—

(a) Every word not occurring in a good English dictionary of the present day.

(b) Every word which, though occurring in a good English dictionary of the present day, is used in a sense differing from any definition of the word given in such dictionary.

(c) Every provincial pronunciation of any word which is itself not a provincialism.

(d) Every provincial phrase or expression.

(e) Every provincial name of an animal, or vegetable, or other object.

(B) To state where and when each recorded provincialism was heard in speech, or seen in writing ; and to accept nothing at second-hand.

(C) To state the sex, probable age and social status, and, if possible, the birthplace, residence, and occupation of the person using each recorded provincialism.

(D) To give the meaning of each recorded provincialism within a parenthesis immediately following the provincialism itself ; and to illustrate the meaning by incorporating the word or phrase in the very sentence employed by the person who used the provincialism.

(E) To give, in all cases requiring it, some well-known word with which the recorded provincialism rhymes, so as to show its pronunciation ; or, where this not practicable, to give a word or words in which the power of the vowel or vowels is the same as in the provincialism.

(F) To state of each provincialism whether it has been noted by Halliwell, or Nares, or any other recognized compiler of provincial, obsolete, or obsolescent words.

(G) To write the communication respecting each recorded provincialism on a distinct and separate piece of paper, to write on one side of the paper only, and to sign and date each communication; the date to be that on which the recorded provincialism was heard or read.

(H) To make each communication as brief as possible, but not to sacrifice clearness to brevity.

(I) To draw the communications so as to correspond as nearly as possible with the following examples:—

“FLEECHES (= Large Flakes. Rhymes with *Breeches*). A servant girl, a native of Prawle, South Devon, residing at Torquay, and about 23 years of age, stated that the snow was ‘falling in *fleeches*,’ meaning in *large flakes*. She added that the *small flakes* were not *fleeches*.—19th March, 1877. XY.”

“HALSE (= Hazel. The *a* having the same sound as in *Father*, not as in *False*). A labouring man, a native of Ashburton, residing at Torquay, and about 55 years of age, stated in my hearing that he had put an ‘*alse*’andle into his hammer; meaning a *hazel* handle (see *Halliwell* and *Williams*).—19th March, 1877. XY.”

2. That the Report of the Committee to be presented to the next Annual General Meeting of the members of the Association shall include all suitable communications received by the Secretary not later than the 1st of June next, and that all communications received after that date shall be held over for another year.

3. That all meetings of the Committee shall be held at Exeter; that the Secretary shall convene them by separate notices to each member, posted not less than seven clear days before the dates of the meetings; and that two members shall be sufficient to form a quorum, with power to act.

4. That a meeting of the Committee shall be held not later than the 21st of June next, to receive and decide on a report to be prepared and brought up by the Secretary.

It is desirable to call the attention of observers more particularly to—

1. Pronunciation. To note more carefully—

(a) Vowel sounds, as in the various qualities:

Of *a* (as is found in *shall, gate, father, wall*).

Of *ay* (as in *day, pay, say, may, maid, &c.*), noting carefully whether it has the sound of *ā* long, as in English *play*, or whether it has the broad sound of long *ī*, as in the Devonshire *ma-aid* (maid).

Of *e* (as in *pet, glebe, where*).

Of *i* (as in *pit, first, fight*).

Of *o* (as in *top, done, gone, bone*), noting carefully if there is any fracture approaching two syllables, as in the ordinary Devonshire *bō-ūn* (bone), *pā-ir* (pair), &c.

Of *u* (as in *but, bull, church, use, &c.*).

(b) To note more carefully the consonants; *i.e.* if any are inserted, as in *finest* for *finest*, *smallest*, &c., or if any are omitted, as in *ring-er* for *finger*, the received pronunciation having two *g*'s, *finger*, and not one, as in *singer*. To note carefully what English words beginning with *f* or *s* are pronounced with *v* or *z*. Careful attention will show that the distinction between *f* and *v*, or between *s* and *z*, is as distinct in the dialect as in the literary language. Also to observe what words ending in *f* or *v* are peculiarly pronounced; *i.e.* whether *calf* is not pronounced *calv*; loaf, *loav*; sheaf, *sheav*; &c. Whether words ending in *f* drop or change them to other sounds, as in—*Bailiff*: is it pronounced *baily*? *Plaintiff*: is it *plainty*? Is not *self*, *zull*? Is not *handkerchief*, *hangkecher*, &c.? Do words ending in *v* make any change? Is *give* ever pronounced *gee*? Are *gave* and *given* the same as spoken by peasants? Are *have*, *serve*, *above*, *active*, *abusive*, and many others ending in *ive*, not changed? Is *r* before a short vowel not transposed? *i.e.* how are *red*, *run*, *Richard*, *riddance*, *great*, *front*, *grin*, and many others pronounced?

2. To observe more carefully grammatical peculiarities.

(c) How are plurals of nouns formed whenever they are not the same as in received English; for instance, what is the plural of *beast* or *priest*? Are any plurals now made in *en* or *n*, as *shoen*, *treen*, *housen*? Are any made by change of vowel, as in *man*, *men*, *tooth*, *teeth*, &c.? Are any plurals the same as in the singular, as in *sheep*, *deer*, *grouse*, &c.? Or if sometimes the words are changed, and sometimes not, under what circumstances do they remain unaltered or otherwise? For instance, "the frost will do good to the bud," is a common saying, and quite grammatical; yet *bud* is essentially in the plural number. So we say a "ten pound note," "a six foot wall," "a five bar gate." These phrases are all good English, and the nouns are all plural, though in each case the noun has another plural, as in *buds*, *pounds*, *feet*, *bars*. What is there in the dialect of the same kind?

(d) How is the genitive or possessive case formed? What circumstances would determine a speaker to say "*his head*," or "*the head o' un*;" "*Jim's father*," or "*the father of Jim*"?

(e) As to adjectives. How are the comparisons formed? Note every variation from literary English.

Are particular similes used with certain adjectives, such as "It was so dark's a bag"? Give all the words you hear used

to express the absolute superlative, such as *bag* with *dark*, *vanity* with *light* (levis), &c.

Note all distinguishing adjectives; *i.e.* the cases in which *this*, *thick*, *thicky*, *thicky there*, *that*, *that there*, *they* (as in *they pigs*) are used. Is *them* (as in *them apples*) ever used?

(f) As to pronouns. Is there any variety in the first person sing. in the various cases of nom. acc. dat. in which it is used? Is the second person sing. used often? If so, in what way? How is the third person sing. used? Is the pronoun *it* often heard? and is the word always used as in literary English?

How are pronouns affected by the prepositions? *i.e.* do you hear *to*, *from*, *in*, *upon*, *of*, *with*, *I*, or *me* (*i.e.* *to I*, or *to me*)? *he*, *her*, *him*, *it*, &c. (*i.e.* *to he* or *to him*)? *we* or *us*? *they* or *them*?

(g) As to verbs. Are *to see*, *grow*, *know*, *shear*, *swear*, *bear*, *begin*, *bleed*, *blow*, *breed*, *build*, *cleave*, *come*, *draw*, *drink*, *eat*, *fall*, *fling*, *fly*, *forsake*, *freeze*, *hang*, *meet*, *ring*, *run*, *see*, *shed*, *shoot*, *sing*, *sink*, *sling*, *spin*, *spring*, *sting*, *stink*, *strive*, *swim*, *swing*, *throw*, *weave*, *win*, *wring*, all, or any of them, conjugated as in literary English?

Are *to break*, *drive*, *speak*, *cleave*, *steal*, *tear*, *take*, *creep*, *raise*, not very differently conjugated from book English? Is the inflection *eth* much used? Is it used with all the persons, sing. and plur.? Is the full syllable sounded, as in *eateth*? or is it shortened, as in *eat'th*? Is the prefix to the past participle often used, as in "I've a-brokt my coat"?

CONTRIBUTIONS.

Each provincialism is placed within inverted commas, and the whole contribution ends with the initials of the observer. All remarks following the initials are simply editorial.

The full address of each contributor is given below, and it must be fully understood that he is responsible only for the statements to which his name is appended:

- A. W. A. = Col. A. W. Adair, Heatherton Park, Wellington.
- J. F. C. = Rev. J. F. Cornish, Christ's Hospital, London.
- G. D. = Mr. George Doe, Torrington.
- G. M. D. = Mr. G. M. Doe, Torrington.
- F. T. E. = Mr. F. T. Elworthy, Foxdown, Wellington.
- F. H. F. = Mr. F. H. Firth, Cator Court, Ashburton.
- J. M. H. = The late Rev. Treasurer Hawker, Berrynarbor.
- W. C. L. = Dr. W. C. Lake, 2, West Cliff, Teignmouth.
- S. R. = Rev. S. Rundle, jun., Vicar of Godolphin, Helston
(contributions from Stockleigh Pomeroy).
- R. W. = Rev. Preb. Wolfe, Arthington, Torquay.

REFERENCES.

The following is a list of the authorities either quoted or who are referred to as illustrating the words contributed. A great number of others have been consulted, but those only are referred to who have something to the point.

For several quotations from books not named in the following list the Editor is indebted to his friend Dr. Murray, the accomplished Editor of the *New English Dictionary*, to whom best thanks and acknowledgments are hereby cordially offered.

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"ABUSEFUL = abusive. A middle-aged tradesman, of Torrington, said, 'He was very *abuseful*.'—November 1st, 1882. G. M. D."

Hal. gives this as *Hereforsh.* *Web.*, rare.

"He scurrilously reviles the king and parliament by the abusive names of hereticks and schismaticks." A.D. 1693. T. Barlow, *Remains*, p. 397. See *New Eng. Dictionary*.

"ACT = to simulate, to pretend, to counterfeit. At Culmstock a gamekeeper, aged about 36, said of an old dog that appeared to be lame, 'He idn on'y acting lame, he always do, nif he reckons he've a-worked enough.'—December 24th, 1883. F. T. E."

Compare "act" (4), *New Eng. Dict.* Here the sense is not precisely the same as the above, nor does it seem to occur in literature.

"ADAM AND EVE = Wild Orchis. 'Those flowers have an old-fashioned name, Adam and Eve.' Said by a man, 64, native of and resident in Stockleigh.—May 5th, 1884. S. R."

Orchis maculata.

Britten gives this as the name of the tuber, from the "fancied resemblance to the human figure." There is constant confusion among dialect speakers between roots and flowers.

Another wild orchis (*O. latifolia*), "The root is generally known as *Adam and Eve*, the tuber which sinks being Adam, and that which swims being Eve."

"ALL ABOUT THE GO = the neighbourhood, district. 'I have bin to Cheriton, and all about the go.' Said by a man, 45, native of and life-long resident in Stockleigh Pomeroy.—May 9th, 1884. S. R."

"ALL-VORE. The open furrow or trench made at the finish of the ploughing of a piece of land, when in so doing it has been *thrown abroad*.—November 23rd, 1883. F. T. E."

See BY-VORE. Gather, Throw abroad.

It has been suggested that this is the '*heal-furrow*;' but if so, the term would be more correctly applied to the *by-vore*, because in the above the process is distinctly to uncover and to leave open, and not to *heal*.

The quotation below shows that *vore* is not a corruption, but an old English word:

"*þay prykede hure stedes wiþ hure spores' & þan þay runne away!*

Ne spared rigges noþer vores! til þay mette þat pray"

A.D. 1380. *Sir Ferumbras*, l. 1565.

"AMMIT. A farm bailiff, about 60 years of age, a native of North Devon, said, in my hearing, 'Now, lads, let us go to ammit,' meaning *lunch*.—July 30th, 1883. F. H. F."

"AGAINST = to meet. A young man, residing near Torrington, said, 'I went against her.'—August 25th, 1883. G. M. D."

See Third Report of Committee on Devon. Provincialisms.

This use is not uncommon in early writers.—*Hal*.

The real meaning is 'towards,' and hence it has acquired the sense of meeting.

"*þen wey he nom to Londone he & alle his,
As king & prince of londre wiþ nobleye ynou;
Aþen him wiþ uair procession þat folc of toune drou,
& vnderueng him vaire inou as king of þis lond."*

Robt. of Gloucester, *Will. the Conqueror*, l. 210.

"*And preyeth hir for to riden aþein the queene,
The honour of his regne to susteene."*

A.D. 1386, Chaucer, *Man of Lawe's Tale*, l. 4811.

"*Bot when Seynt Wultrud wyst þat þuse relekes weron comyng,
Wt procession aþeynes hem, fulle holylyche he went þo,
And brouȝt hem to þe aut', þe ladyes syngyng,
And set þat lytulle shryne upoñ Seynt Edes auter also."*

Chron. Vil., A.D. 1420, st. 748.

"*What man is this that commeth agaynst us in the felde?"*

A.D. 1535, Coverdale's Vers. (Genesis xxiv. 65.)

"*Against whom came queen Guenever, and met with him,
and made great joy of his coming."*

A.D. 1634, Malory, *Morte d'Arthur*, vol. i., p. 179 (ed. 1816). See *New English Dictionary*.

"APSE (rhymes with 'lapse') = abscess. A middle-aged married woman, of the working class, residing at Torrington, said, speaking of her child, 'She had an *apse* in her head.'—November 1st, 1882. G. M. D."

This is not uncommon. It very probably comes from ignorant folks mistaking *abscess*, pronounced *ap-ses*, for a plural; hence the singular would naturally be *aps*.

"ARCHANGEL. See YELLOW ARCHANGEL."

"AR-RABBITS = Wild Geranium. 'We calls them sparrow-burds, but their right name is ar-rabbits.' Same authority as for 'bittle.'—May 26th, 1884. S. R."

Geranium Robertianum.

This is clearly *arb-rabert*; i.e. Herb-Robert worn down to the above.

"BALKER (rhymes with 'Walker') = whetstone of a scythe. A tradesman, a native of Torrington, aged about 60, used this word. See WRIGHT. A friend of mine, who for some time resided in S. Devon, informs me that there the whetstone is called a *barkall*.—October 5th, 1882. G. M. D."

Peng. has barker.

Hall. and *Jenn*. have bawker, bawker-stone.

"BEE-PLANT = Borage. 'This is the bee-plant; you will always see bees about it.' Same authority as for 'concern.'—May 13th, 1884. S. R."

Borago Officinalis. Often called 'bee-bread.' It is frequently grown purposely for bees.—*Brit*.

"BIRD'S-EYE = Blue Speedwell. 'My little girl asked me to pick her some bird's-eyes.' Same authority as for 'bittle.'—May 17th, 1884. S. R."

This name is applied to several varieties of *Veronica*.

"BITTLE = mallet of wood. 'I must ask the carpenter for his bittle.' Said by a labourer, 23, native and life-long resident in Cheriton Fitzpaine.—April 29th, 1884. S. R."

There are many varieties of this word. It is called, *bille*, *beetle*, and in Somerset, most commonly, *battle*.

Ang. Sax. Bos. Bytel = a mallet, Bytl = a mallet.

Promp. Parv. Betylle = *Malleus*, *malleolus*.

Cath. Ang. Medulla. Occa, a *clerybetel*.

Huloet. Betle, or malle, for calkens. *Malleus stuparius*.

"Aut þer 3e schulen iseon bunsen ham mit tes deofles bettles, þet wo schall ham beon aliue."—*Ancren Riwe*, A.D. 1250, p. 188.

A.D. 1535. Coverdale, 1 *Chron.* xxi. 3: "Hokes & betels of yron."

A.D. 1597. Warner, *Albion's England*, p. 332: "Dung-forks, flayls, plow-staues, axes, hedging-beetels."

Falstaff. If I do, fillip me with a three-man beetle.—*2 Henry IV.* act 1. sc. 2.

A.D. 1664. Evelyn, *Kal. Hort.*, p. 43: "The hole made with an oaken-stake and beetle."

"BITTLE=increase in size. A charwoman of Great Torrington, speaking of some onions, said, 'They won't *bittle* unless you thin them out.'—July 12th, 1884. G. M. D."

"BLAKES. A term used to characterize the peculiar semi-animate condition into which a child comes at the close of a long fit of coughing in whooping-cough, previous to the inspiratory whoop. 'He quite blakes away' is a term habitually used under such circumstances.—Teignmouth, May, 1884. W. C. L."

The term implies faintness, and although in the above instance the child became very red, yet the word really means the same as *bleach*.

Ang. Sax. Bos. Blæcan=to bleach, to fade.

Prompt. Parv. Blakyn', or make blake. *Denigro ritupero, increpo.*

"And as he neghet bi a noke,
The king sturenly him stroke,
That bothe his breccs con blake."

Robson's *Metrical Romances*, p. 64.

"BLANKS=sparks from a fire. 'The fire was blazing so that the blanks fell on the thatch. Same authority as for 'bittle.'—May 1st, 1884. S. R."

Very common both in Devon and Somerset. *Hal.* and *Williams* copy *Jennings*, who has *blanker*; but that is not heard west of Taunton.

"BLAUTHS for 'blows.' 'The wind *blauths* one about.' Used by a woman, formerly a domestic servant, about 70, a native of Devonshire, long resident at or about Teignmouth.—February 1st, 1884. W. C. L."

This is very curious, and shows language in process of formation. This old woman from her youth had been accustomed

to use the *th* form—*the wind blauth*—but during service or town life had become accustomed to hear the literary form *blows*, and so unconsciously tacked on the modern inflection to the older one, and made a reduplication. Many analogous cases might be cited. Long *o* of lit. Eng. is often *au*. Compare *nawz* = nose; *nauth* = knows.

"BRICKS = small loaves of bread; before being baked they are of the size and appearance of bricks. 'Years ago, at Shebbear, we were very much surprised when we sent for a brick to clean knives, upon having a loaf of bread sent us. They call them bricks there.' 'Yes, so they do now at Thorverton.' Said by a carpenter, born at Thorverton, lately come to Stockleigh, aged about 36.—May 4th, 1884. S. R."

Are not these small loaves usually baked in square tins?

"BOLDERY = thundery, dark. 'We shall have rain; the sky is looking boldery.' Said by a farmer, 27, born at Shobrooke, lived many years at Stockleigh.—May 29th, 1884. S. R."

Hal. gives this as North. Compare Howdering.

"*Tha wut let tha cream chorn be all horry, and let the melk be buckard in buldering weather.*"—Ex. Scold, l. 205.

"BULLERS = (flower inclosed). 'They be bullers.'—May 23rd, 1884. Same authority as for 'trim-tram.' S. R."

The flower enclosed to the editor was that of the small hog-nut, *Bunium flexuosum*; but the term is applied to any kind of umbelliferous flowers, particularly to the limperscrimp, or cow-parsnip, *Heracleum sphondylium*.

Called also bilders, usually billers, pronounced *bullers*.

See *Hal.*, *Wright*, *Britten*.

"BUM = beat into. A labouring man, aged about 56, living at Torrington, said, 'You can't *bum* it into this chap.'—December 4th, 1882. G. M. D."

See *Wright* and *Halliwell*.

Very common. The meaning is to *din* or *dun* by constant reiteration. The same word is used respecting repeated application for payment. "I can't abear *bumin* vokes vor money."

"BUSSICKY. E. W., a native of the South Hams, aged 78, said, May 1st, 1883, 'I'm rather tissicky, and when I come to go against a hill I get bussicky.' J. F. C."

See TISSICKY.

"BY-VORE = by-furrow. A farmer, about 60, long resident in Culmstock parish, said to me, in explaining the ploughing at a recent ploughing match, 'In gathering, you know, they've a-got vor to make a by-vore, and in drowin' abroad they makes a all-vore.'—November 23rd, 1883. F. T. E."

See GATHER. Throw abroad.

"CABBED = won over. A middle-aged labouring man of Torrington said, 'Somehow, you've been *cabbed over*.'—December 18th, 1882. G. M. D."

Cabby is sticky, so the above probably implies that the person was pertinaciously stuck to until he yielded.

"CANDLESTY = secret. A moorman, name and age unknown, said, 'He creep'd along so candlesty.' [This seems to be a form of 'clandestinely.']—May, 1884. J. F. C."

Transposition of *l* is very common. Compare *calvatry*, the usual form of *cavalry*.

"CAR'D (rhymes with 'bard') = carried. A labouring man of Torrington, aged about 40 years, said, 'He *car'd* it a little way.'—December 4th, 1882. G. M. D."

See *Wright* and *Halliwell*.

Common to the whole South of England. Many words drop final *y*. Compare *stud*, *slipper*, *quar*, the usual forms of *study*, *slippery*, *quarry*.

"CHILD = female child. This word is very generally used in the neighbourhood of Torrington in this sense, it being a common question on the birth of an infant: 'Is it a *boy* or a *cheeld*?' See *Halliwell* and *Wright*.—May, 1883. G. M. D."

"Shepherd. (*Taking up the child*.) *Mercy on's! a barne—a very pretty barne! A boy, or a child, I wonder?*"

Shakespeare, *Winter's Tale*, act iii. sc. 3.

"COLT'S ALE = (in Stockleigh Pomeroy district) two quarts of cider, or a shilling, to the blacksmith who shoes a colt. He says, 'I could not bring the colt's ale with me, but I will send it.' Blacksmith, 25, lives at Stockleigh, brought up at Molland until about 20, then travelled in various parts of England.—May 31st, 1884. S. R."

"Colt-ale" generally means something quite different from this.

"COLT'S-TAILS = appearance of clouds. Known as mare's-tails. 'I have heard that mare's-tails denote meteors and change of weather.' 'We call them colt's-tails here.' Farmer, 58, native of Cruwys Morchard, near which place he has resided.—April 3rd, 1884. S. R."

"CONCARN = disturbance, uproar. 'There has been a regular concern about it.' Farmer's wife, 52, native of Cruwys Morchard, near which place she has resided.—March 29th, 1884. S. R."

Very common in Devon and Somerset.

"COW-FLOPS = Fox-gloves. A description of a Fox-glove was given, on which it was said, 'I know; they are Cow-flops.' Same authority as for "Adam and Eve." May 3rd, 1884. S. R."

Digitalis purpurea.

See *Hal., Wright, Britten.*

"CRAKING AN' CRONIN' = grumbling. 'No one ever heerd me craking an' cronin'.' Same authority as for 'all of a dring'.—April 29th, 1884. S. R."

Same as "croaking and groaning." Very common.

"CRANES = (? herons). 'I knew that we should have fine weather, as I saw the cranes flying up the stream.' Same authority as for 'tilt'.—November 5th, 1884. S. R."

Herons are always called cranes in the south-west. There are no cranes.

"CRIPPLESHIP = lameness. A tradesman, of Great Torrington said, 'I object to serve as constable on account of my *crippleship*'.—September 23rd, 1883. G. M. D."

"CUCKOOS = Ragged Robin. 'That's a nasty old weed.' 'Oh, that's what we call cuckoos!' Same authority as for 'bittle'.—May 10th, 1884. S. R."

Lychnis flos-cuculi. Often called Cuckoo-flower. See *Hal., Prior, Wright, Nares.*

"DENIED = forbad. A young woman, a native of Torrington, said, 'P— *denied* her coming into the house'.—December 4th, 1882. G. M. D."

Hal. and *Wright* give "to refuse," "to reject," but in the

sense of *to forbid* the use seems peculiar to the West-Country. In a parish church, well known to the editor, on the publication of banns between two persons, a man got up and shouted, "I deny it, and defy it; th' 'ummun's mine!"

In West Somerset this use is not uncommon.

Shakspeare uses *deny* in the sense of *refuse*, but scarcely *forbid*:

"York. *If York have ill demean'd himself in France,
Then let him be deny'd the regentship.*"

2 *Henry VI.*, act i. sc. 3.

"DEVONSHIRE COAT-OF-ARMS = mark on horse's knees, caused by a fall. 'That's a good name for a horse's broken knees, the Devonshire mark.' 'Oh, we have another name for it, the Devonshire coat-of-arms!' Farmer, 72, born at Cheriton Fitzpaine, lived in the neighbourhood all his life.—May 7th, 1884. S. R."

This is in common use far beyond the county of Devon.

"DEVONSHIRE MARK. *Vide supra*. 'The horse wasn't wuth much; it had the Devonshire mark.' Same authority as for 'Devonshire coat-of-arms.' April 30th, 1884. S. R."

"DIMITY (rhymes with 'affinity'). On the 9th November, 1883, a labourer, about 70 years of age, a native of Widecombe, said to me, at dusk, 'It's getting most dimity for these job.'—F. H. F."

Compare *dimpity* in Third Report of Devon. Ass. Com.

Dimity seems like a diminutive of the well-known *dimmet*; or it may be the adjectival form, made in the regular way by adding *y*.

"DISH-WASHER = Wagtail. 'On the 6th December, 1883, on my pointing out a very fine specimen of this bird running on the ice, a carpenter, native of Widecombe, about 32 years of age, said to me, 'We call them dish-washers here about.' There is an old saying, 'A woman's tongue goes like a dish-washer's tail.'—F. H. F."

See *Hal., Wright, Williams, Pengelly*.

The common name throughout the West.

"*The fleshe of these flesh crows and of the wagtayles or dish-washers as we terme them . . . is of evill nourishment and disgestion.*"—A.D. 1575. G. Turberville, *Book of Falconry*, p. 137.

"Doos (rhymes with the 'blues'). A woman, about 50 or 60, long resident in Teignmouth, speaking of her husband, a labouring man, said to me, 'He is quite blind, and I have hard *doos* with him.' Did she mean dues?—November, 1883. W. C. L."

This means *doings*. Compare *much ado, a great to-do, &c.*

Not at all uncommon in Somerset. "There was fine doos, sure 'nough."

"DOWN-ARG = to contradict, to assert violently. At Culmstock a gamekeeper, aged about 36, said to me, 'They down-arg me that they vound the hare out 'pon the common, but I knowed better.'—October, 1883. F. T. E."

See *Hal., Wright, Pul., Jen.*

Common in the western counties, except Cornwall.

"DRUCK-STOOL (the first syllable rhymes with 'luck') = the threshold of a door. A labouring man, of Torrington, aged about 60, said, 'He put her out over the *druck-stool* of the door.'—December 4th, 1882. G. M. D."

"I was visiting an infirm old woman from the parish of Coleridge, North Devon, who had come to reside in this parish, and heard her say, 'The child will fall on the *druck-stool*' (u as in duck). I enquired what it meant. She replied, 'That there piece of wood on the ground between the derns of the front door.' It was an old-fashioned cottage, and the 'druck-stool' was three or four inches above the level of the floor, designed, I suppose, to keep firmly the derns of the door in their place. Is this word a corruption of *threshold*?

"Many men that *stumble* at the threshold."

"Shakspere, *3 Henry VI.* iv. 7.

—November 19th, 1883. R. W."

Quite common in West Somerset, North Devon, and Exmoor.

See *Courtney, Couch, Pengelly, Hal., Wright.*

"DRING = all of a dring. All in confusion. 'I can't abear to see the house all of a dring.' Said by a woman, 84, native of Shobrooke; lived most of her life in Stockleigh.—April 29th, 1884. S. R."

This is a very common expression in Devon and Somerset. The meaning is crowd. Hence if crowded with articles out of place, the house would be in confusion. Compare German

dringen, to press, to crowd. The word *dringet*, a crowd, is common in Devon and Somerset.

See *Hal., Wright, Pengelly, Pulman, Jennings, Williams, Courtney, Couch, &c.*

"Well! in a come—King George to town,
With doust and zueat az netmeg brown,
The hosses all in smoke;
Huzzain, trumpetin, and dringin,
Red colours vleeing, roarin, zingin,
So mad simm'd all the voke."

P. Pindar, *Royal Visit to Exeter.*

"DUCK'S-BILLS (*Dielytra spectabilis*). 'Here's a duck's-bill.' Girl, 10; born near Tiverton; lived at Stockleigh Pomeroy for last three years.—May 13th, 1884. S. R."

"DUKE=simpleton. 'Her mother must be a regular old duke.' Same authority as for 'trim-tram.'—May 26th, 1884. S. R."

"FAST=shut. 'The door is fast.' Used by a labourer's wife, a resident in Teignmouth. Of frequent use.—January 9th, 1884. W. C. L."

In Devon and Somerset it is always "put vast the door," probably because *shut* means *shoot*, and is not often used in the sense to close, when speaking of a door, but of a *box* or *cover* it would be used. So also, "Shut thy taty-trap," is a common synonym for "Hold thy tongue."

"FLUTTERY=dressy. 'I am no fluttery body.' Woman, 50, native of and life-long resident in Stockleigh.—May 17th, 1884. S. R."

"FAULTZ (rhymes with 'waltz')=deep, artful. 'That pony is mortal faultz. She slipped out of the stables before I could lay hands on her.' Same authority as for 'bittle.'—May 12th, 1884. S. R."

This is *false*. A very common expression for cunning, sly. See *Hal., Pul., Wright.*

"FRICKET=flicker. 'How that lamp frickets.' Same authority as for 'Concarn.' May 13th, 1884. S. R."

Probably a pronunciation peculiar to the individual. Many people cannot distinguish between the sound of *fl* and *fr*.

"FULL-DETERMINED = fully-determined. A gamekeeper, about 35, living in Culmstock parish, said to me twice, 'I be vull determined to know the rights o' it.'—November 30th, 1883. F. T. E."

"GAKETH (rhymes with 'taketh') = ruffles. A shoemaker of Torrington, aged about 60, said, whilst showing me a canary, 'He's rather frightened now, so he *gaketh* up his feathers.'—October 7th, 1882. G. M. D."

"GATHER. 'Each ploughman is to plough the part allotted to him by gathering one-third, and throwing abroad two-thirds of the 60 yards.'—Printed particulars of a ploughing match, held at Culmstock, October 31st, 1883. F. T. E."

Applied to ploughing. A piece of land is ploughed by working up one way and back another, the two furrows thus made being called a "round." Working with an implement which turns the soil only in one direction, it follows that the two furrows made in any round must lie in opposite directions, either towards or away from each other. When the ploughman turns to the right for his return journey he "*gathers*," *i.e.* he makes the furrows lie towards each other, and consequently at the last round, or finish, two rolls of earth are thrown up against each other, in what is called a *by-vore*, *i.e.* the last is thrown against the first, the precise opposite of an *all-vore*. (*q.v.*)

See THROW ABROAD.

"GUBBY = thick, sticky. 'Cheap cocoa is always gubby.' Same authority as for 'Concorn.'—May 23rd, 1884. S. R."

"HAMES = ironwork round a horse's collar, to which the reins and traces are attached. 'The hames is very loose.' Same authority as for 'Colt's-tails.'—May 2nd, 1884. S. R."

Usually called *hameses*. Scarcely a provincial word, as it is used everywhere.

See *Hal., Wright, &c.*

"HAM = meadow (level) by the waterside. 'That ham's a long way from the farm.' Same authority as for 'Trimtram.'—May 19th, 1884. S. R."

See *Hal., Wright, Britten, Farming Words.*

Common in Devon and Somerset.

In *Scotch* this is *haugh*; North Midlands, *haw*; and in Suffolk and East Anglia, *howe*.

"HARDER = louder. 'Speak harder; for I can't hear you.' Used by a tradesman of Great Torrington.—January 17th, 1884. G. M. D."

"HAT. To set up the corn in large double stitches, and to cover down with a capping or thatch of the corn turned ear downwards, and tightly bound round with a bind of the same. A farmer, at Culmstock, about 56, said to me, 'I reckoned to a-car'd thick piece o' wheat, but he id'n 'ardly fit, not eet, zo I told em to go and hat'n up.'—September 10th, 1883. F. T. E."

A "hat" is much larger than a *cap-stitch*, but not so large as a *wind-mow*.

"HEAL OVER = cover over. 'The sheep was haled over.' Same authority as for 'Bittle.'—May 17th, 1884. S. R."

See Sixth Report Devon. Assoc. Com., *Peng*.

"HEALER (rhymes with 'tailor') = a horsecloth. A farmer at Huish Champflower, but native of Churchstanton, about 50 years of age, said to me, 'Better not put the healer 'pon the horse 'gin he's a bit colded;' and immediately after said to his son, 'Don'ee put the healer 'pon un, vor a bit.'—October 9th, 1883. F. T. E."

"HAILER = healer for coverer. 'Have you got the *hailer*, sir?' Used of a rug by a cabman, age about 40, a resident in Teignmouth.—January 2nd, 1884. W. C. L."

This use of *healer* for the article or material with which a thing is covered does not appear to have been noted before; but two contributions from widely-separated neighbourhoods show it to be common, and also that *hailer* is the usual pronunciation in the western counties, shading off through the closer vowels—*heeler*, *heller*, *hellier*—to *hiller*, *hilier*, and perhaps to *hiler* in the midlands and eastern counties. The word is very common in the Wycliffe version as a verb; generally spelt *hil*, but occasionally *hel*.

"*And thei camen til to me, and thei ben hilid with schame.*" Wycliffe version, *Job* vi. 21.

"*Bifor that Y go, and turne not aȝen, to the derk lond, and hilid with the darkness of deth.*"—*Ib.* x. 22.

As a covering Wycliffe uses *hilyng*, *hiling*.

"*But the sones of men: schulen hope in the hilyng of thi wyngis.*"—*Psalms* xxxv. 9.

See also *Job* xxiv. 8.

"HEMPLE (rhymes with 'temple') = a Scotch mist, or drizzling rain. A gentleman of Bovey Tracey (see 'Swaling') used the word in the above sense in my presence, and habitually so uses it. He remarked, 'It is only a hemple'—conveying the idea of a minimum of drizzle.—April, 1884. A. W. A."

"HOLLIN = shouting. A labourer of Torrington, aged about 40, said, 'He was *hollin* "murder."'—December 4th, 1882. G. M. D."

The usual pronunciation in Devon.

*"I thort zo, thinks I, I'm in vury gude time,
Zo I was, vur ta zee min go down droo tha line,
A puffin an blawin, an like a yung cheel,
A screechin an hollin as if ha cude veel."*

Nathan Hogg's Letters, *Peter's Tower, tha Raylraud.*

"HOVERS (rhymes with 'covers'). The overhanging parts of a hedge or bank of a river, where hollowed out by weather or water. At Culmstock, a gamekeeper (see 'Act') while rabbiting said, 'Be sure and look along the hovers, thick zide o' the hedge.'—December 24th, 1883. F. T. E."

So one often hears of the "hovers" where the trout like to lie.

Pulman has "*hurvers* (hovers), the hollows along the river's banks in which fish shelter themselves."

It is, however, by no means confined to river banks, but it is a thorough West-Country word.

"HOWDERING. On Saturday, August 25th, 1883, I remarked to the Rev. H. W. Toms, rector of Combe Martin, North Devon, for the last forty years, that the weather (very fine before), appeared to be changing. 'Yes,' he said, 'it looks "howdering," as the people call it;' that is, according to his explanation, 'clouding up,' 'getting darker.' J. M. H."

This is the same as *huldering*.

Hal. and *Wright* have 'hulder,' to blow violently. Hence to have a stormy appearance. Compare 'boldery,' which is probably the same word. Initial *b* easily changes into *h*; thus, *bolder*, *wolder*, *older*, *holder*, and *howder*.

"IT'S A BEEN = it *has* been. A middle-aged tradesman, of Torrington, said, '*It's a been* going on for some time.'—June 7th, 1883. G. M. D."

This is the old Teutonic prefix to the past participle (the

ge of Ang. Sax., German, and Dutch), still retained in West-Country speech, and to be heard with nearly every verb. See Fourth Report Devon. Assoc. Com.

"*Muche ap þe sorwe ibe . . . Of moni bataile þat ap ibe.*"

A.D. 1298. Robt. of Glouc., *Will. the Conq.* ll. 1, 3.

"*& wor Harald adde is op ibroke · þat he suor mid is riȝt hond.*"

Ib. l. 41.

"*Ofte meny men habbeth y-be þerynne & ywalked aboute wipynne & yseye ryuers & streemes.*"

A.D. 1387. John of Trevisa, *Description of Britain*, lib. i. c. 41, l. 89.

"*And Kyng Egberte sustre also he was,*

And þere inne also hee was y bore."

A.D. 1420. *Chron. Vil.*, st. 35.

"K. Hen. . . *Her words y-clad with wisdom's majesty,
Makes me from wandering, fall to weeping joys.*"

A.D. 1600, Shakspeare, 2 *Henry VI.*, act i. sc. 1.

"Gower. *Now sleep y-slaked hath the rout;
No din, but snores the house about.*"

Ib., *Pericles*, act iii.

In all these instances, which are merely typical of the literature of the time, we may take it for granted that the *i* or *y* was pronounced as a very short indefinite vowel sound, which might just as well have been represented by *a*, as is now done by dialect writers (see *Nathan Hogg*, *Wolcot*, and others), or *e*, or *o*, or, still better, by short *ü*.

"IVY-DRUMS = stems of ivy around a tree. 'How thick those ivy-drums are.' Same authority as for 'Devonshire Mark.'—May 7th, 1884. S. R."

The ordinary term in Devon and Somerset. It is not applied to green succulent shoots, but only to large woody stems or branches.

"JERUSALEM SEEDS (leaf inclosed). 'My mother used to be very much over they Jerusalem seeds as an arb.' Same authority as for 'tilt.'—May 31st, 1884. S. R."

The leaf enclosed was Lung-wort, *Pulmonaria officinalis*, called sometimes Jerusalem Cowslip, or Cowslip of Bedlam.

See *Brit.*, *Prior*.

"JONNICK (adj. and adv.) = pleasant, agreeable, easy to get on with. At Culmstock a farmer, about 60, said, in my pre-

sence, of another man, 'I thought we should a-got on very well, but he wad'n no way jonnick.'—January 22nd, 1884. F. T. E."

See *Williams*.

"LIFTING STOCK = flight of stone steps used for mounting horses. 'Upping stocks, or lifting stocks they be.' Same authority as for 'trim-tram.'—May 23rd, 1884. S. R."

"LOAD. My son met an old resident and native of this parish (Widecombe), aged about 70, now living at Kingsbridge; and in the course of conversation the old man said, 'I don't think your father loads as much as formerly'—meaning that he was less portly.—July 30th, 1883. F. H. F."

"LODGE = lodgings. A man, dressed and tattooed like a sailor, born and bred at Exeter (confirmed by speech), age about 40, said to me of some garden netting, 'If yer honour don't like this, I've a got a lot more down to my lodge.'—May 28th, 1884. F. T. E."

This is the usual form; "Lodgings" is a genteel word.

Cf., in the sense of temporary place of abode:

"*par loges & pare tentis op bei gan bigge.*"

A.D. 1330. R. Brunne, *Chron.*, p. 67.

"*As soone as the scottis sawe theym, they issued owte of theyre lodges a foote.*"—A.D. 1523. Ld. Berners, *Froissart*, vol. i. ch. 18, p. 23.

"LOSTING for losing. A tradesman of Torrington said, when speaking of a gentleman who was leaving the town, 'We are in danger of *losting* him.'—November 3rd, 1883. G. M. D."

Always "to lost" in Devon and Somerset, though unnoticed by any of the glossarists, who however, for the most part, have merely copied from one another.

The Rev. A. W. Grafton, rector of Castle Cary, writes to me, in remarking on our last Report, November 17th, 1883: "There is no such verb here as 'to lose'; it is distinctly *to lost*. 'I can't afford to lost it' is the best definite phrase I can recollect; it was said to me by a labourer's wife of 25, a few days ago. The word came into other sentences as well, but I cannot write them down with certainty."

"MAIDEN-COMB = comb made by bees at the top of a hive, and taken without destroying the bees. 'We took some

maiden-comb from that hive.' Woman, 65, native and life-long resident at Stockleigh.—May 17th, 1884. S. R."

This is the new white comb of the first year, into which eggs have not been deposited. These latter are laid in the spring, when all the honey has been consumed. Afterwards, when the young bees are gone, the cells are filled with honey for winter store; but neither the comb nor the honey is so good as from the fresh or maiden comb.

"MAMMY-GOG=a softy. A farmer living in the parish of Culmstock, aged about 45, native of Dunkeswell, speaking of a third person, said to me, 'He's a mammy-gog sort of a fuller; he ought to be put in the oven and baked a bit.'—May 24th, 1884. F. T. E."

"MILKMAIDS (flower enclosed). 'We call them milkmaids.' Same authority as for 'Adam and Eve.'—May 7th, 1884. S. R." The enclosures were Cuckoo flowers (*Cardamine pratensis*). See *Brit.*

"MOOT OUT=spring up of corn, grass, &c., after eaten down by sheep. 'I like to see the grass moot out.' Same authority as for 'Colts'-tails.'—Heard April 30th, 1884. S. R."

This is also called "*to wreedly*;" i.e. to throw up many shoots from the same root.

"NANNY-ZULL. The old wooden plough of our forefathers. 'Forty year agone I win'd the champion prize to Broadhem-bury ploughin match way nort but a old farshin nanny-zool.'—November 23rd, 1883. F. T. E."

For speaker see BY-VORE.

"NOGS=earth baked into lumps by the heat. 'We want rain for they nogs.' Same authority as for 'Devonshire Mark.'—May 7th, 1884. S. R."

This is the various pronunciation of *knob*. Very common throughout the West.

"NO THANKY A-HANGD. In the parish of Culmstock when shooting we were lunching under a hedge. The farmer and his son came to talk to us, and, of course, they were invited to join. The son shyly declined; but the old man said, 'I be too old vor to go and wish no thanky a-hangd'—meaning to refuse a good offer and repent afterwards.—October, 1881. F. T. E."

"ONCEST=except. 'All the garden is tilled oncest that piece.' Same authority as for 'Bittle.'—May 18th, 1884. S. R."

"OUCHILS (first syllable sound of *how*)=outside slabs of boards, sawn on one side only. A farmer, born and bred at East Anstey, age about 36, said to me about some board for repairs, 'Tid'n no ways particular; ouchils are good enough for that job.'—May, 1876. F. T. E."

"ORTS=odds, scraps. W. H., aged 50, a native of the South Hams, said, 'I've just been giving the young things the orts.' [*Cf. Timon of Athens*, iv. 3: 'It is some poor fragment, some slender ort of his remainder.']—1884. J. F. C."

Usually given as *scraps, fragments*; but the true idea is *refuse scraps, leavings, waste*. Shells of turnips left by sheep, hay left in the manger, any articles left or rejected after repeated selection, are always "orts." In literature this very old word, after long disuse, is beginning to reassert its place.

Prompt. Parv. "Ortus, releef of beestys mete." *Ramentum ruscum*.

Cath. Ang. "Ortys, forrago (*farrago* A), *ruscus*, or fodder."

See *Hal., Wright, Nares, Skeat, Johnson, &c.*, all of whom are unsatisfactory. We must wait for Dr. Murray.

"OVER=fond of. 'Mother used to be very much over Jerusalem seeds.' Same authority as for 'Tilt.'—May 31st, 1884. S. R."

In very common use. The meaning is scarcely so much 'fond of' as 'choice over'=setting store upon.

"PEYSE, or PAYSE (rhymes with 'raise'). Applied to liquid =to ooze, or trickle very slowly. A native and inhabitant of Culmstock, about 45, who was searching for a leakage in a pond, said to me, 'I knowed we was a-come to the right place, 'cause I zeed how the water had a-peysed out.'—April 14th, 1884. F. T. E."

Hal. has "Peese, to ooze out. (South.)"

Wright, "Peeze, to ooze out; said of a cask that leaks. (Sussex.)"

"PICK=small mark or stroke. A tradesman of Torrington, speaking of some writing, said, 'I think there's a little *pick* over it.'—September, 1883. G. M. D."

"PLAIN = poor. 'A plain field of grass.' PLAIN MONEY = private property in money. 'He had about £1000 plain money.' Same authority as for 'Adam and Eve.' First usage very common.—May 19th, 1884. S. R."

Plain money usually signifies hard cash, or readily convertible security, such as money in a bank, as distinguished from property not so easily realized.

"PLUFF = unwell. 'I was very *pluff* yesterday.' Used by a tradesman of Great Torrington.—May 24th, 1884. G. M. D."

"POLL PARROT. The usual name for a parrot. A woman, of about 50, living in Culmstock parish, came to me and said, 'Did you want to buy a poll-parrot, sir?'—October 10th, 1883. F. T. E."

"PRINCE'S FEATHER = lilac. 'I never saw a white prince's feather before.' Same authority as for 'Brick.'—May 19th, 1884. S. R."

Syringa vulgaris. Common name in Somerset.

"PROVERBIAL EXPRESSIONS, heard between March 21st and May 13th, 1884: 'Cold enough to kill a snipe.' 'As dear as saffron.' 'When we know how to live, then we die.' 'As poor as Haldon.' 'Paddy's lewth: in the wind and out of the sun.'—November 13th, 1883. S. R."

"PULL UP = to summon before a magistrate. A farmer, native of and living in Burlescombe parish, age about 60, speaking of the restrictions upon driving cattle, said, 'You zee we can't turn a head o' stock over the county bounds 'thout being a pulled up directly.'—May 23rd, 1884. F. T. E."

"PUMPLE-FOOT = club-foot. A tradesman, a native of North Devon, about 65 years of age, said, 'She hath got a pumple-foot.'—September 16th, 1882. G. M. D."

See *Hal.* and *Wright*: "Pummel-footed."

The usual term in Somerset.

"PUMP-PIT = a well. A farmer, native of East Anstey (see 'Ouchils'), said, in my presence, 'The pump-pit must be cleaned out before the water'll be fit to drink.'—August, 1873. F. T. E."

This seems the common term in north-west Somerset, and north-east Devon.

"RAP=a piece of garden. 'A house with a long rap of garden.' Advertisement in *Western Times*, April, 1884. In common use. S. R."

Not confined to land. The word means strip, or piece cut off, as a "rap o' cloth," "rap o' board," &c.

"RAUNCH=green, uncooked. 'My husband is fond of what I call raunch things, as cucumbers.' Same authority as for 'Up-sise.'—May 25th, 1884. S. R."

"REEPING=trailing. A carpenter of Torrington not long since said in my hearing, 'The gate is reeping on the ground.' See Palmer's *Dialogue in Devonshire Dialect*.—May, 1884. G. M. D."

Hal. and *Wright* have, "Reep, to trail in the dirt." (*West.*)

"ROBIN WOOD=Ragged Robin. 'That's Robin Wood.' Woman, 30, native of Stockleigh, where she has mostly resided.—May 13th, 1884. S. R."

"Robin-hood" is the ordinary name of the Red Campion, *Lychnis diurna*. It would be an interesting point to decide whether in this case *wood* is the genteel pronunciation of 'ood by those who have been to school, and know that it ought to be spelt with a *w*; or whether 'ood is the corruption of the original *wood* by West-Country folks, afterwards by Easterns and Midlanders adopted, aspirated, and generally mixed up with the name of the bold forester. *Ragged Robin* is another plant—*Lychnis flos-cuculi*.

"ROMAN JESSAMINE=Syringa. 'Miss —— gave me a piece of Roman Jessamine.'—Heard May 31st, 1884. Same authority as for 'Tilt.' S. R."

The common name throughout the West for *Philadelphus coronarius*.

"RUNABOUTS=vagrants, itinerants. A labourer, native, and still living at Culmstock, aged about 45, was working for me at Wellington in a shrubbery adjoining the street; he ceased working to listen to a woman singing to a guitar, and said to me, 'Her zingth well, don'er, zir? her've a-got some-thin' like a voice; tidn' a bit same's most o' thase yer urnabouts.'—April 26th, 1884. F. T. E."

A good specimen of real conservative old English.

"SCRAM-HAND (pronounced 'skram') = shrivelled. 'He's got a scam-hand.' Used by a gentleman of this neighbourhood, aged about 60.—28th October, 1882.—G. M. D."

See *Hal.* and *Wright*: "Scrambled."

The word is really *scramb'd hand*, but is always pronounced as above, because Western speakers drop such inconvenient consonantal sounds as need careful pronunciation. The same person who used the above phrase would just as unconsciously say, "*His hand was a-scramb'd.*"

"SEGUMBER, according to a carpenter (same authority as for 'Bricks') = sycamore. 'Segumber is sycamore.' According to same authority as for 'Maiden-comb' = cedar. 'I put a piece of segumber with the clothes to keep away moths. Lady — had her coffin made of it.—Both heard May 17th, 1884. S. R."

"SHAMMICHES. This word is used in and about Torrington to denote a wretched person or animal; as, 'A poor shammichs of a horse.' 'He's the shammichs of a mayor.' See Rock's *Jim and Nell*. The inhabitants of a part of the borough of Bideford (not the west end) on the 9th November elect the "mayor of Shammichshire," and during the inaugural dinner of the mayor of Bideford, his worship of Shammichshire presents himself with his followers, and condescends to receive offerings for drinking the health of his brother of Bideford.—Torrington, 11th November, 1883. G. M. D."

"SHILLET = decomposed rock, used for garden walks. 'This shillet is nearly good enough for your garden.' Same authority as for 'Adam and Eve.'—April 4th, 1884. S. R."

Applied to a certain and well-defined kind of decomposed rock, and by no means to any other. It is the friable top portion of Devonian clay-slate, found throughout North Devon and West Somerset, particularly along the valleys of the Exe and Barle. Also the regular term in South Devon, strictly in the same sense.

"SIS (rhymes with 'Miss') = to throw. A labouring man, aged about 30, said, 'Sis some of it [earth] over here.'—June 13th, 1883. G. M. D."

"SKINNIED for skinned. 'He's got a finger that's *skinnied*.' Used by a workman of the parish of Langtree, near Torrington.—May 3rd, 1884. G. M. D."

Probably a variety of the fully sounded inflection. Many individuals pronounce *-ed* as *-eed*; as *a-drown-deed* for *drowned*. I have often heard *saveed* in the lessons in various churches.

"SLACK-BACKED = idle. 'He's a slack-backed fellow.' Used by a tradesman of Torrington.—Feb. 2nd, 1884. G. M. D." The past inflection is usually well sounded—*slack-backed*.

"SMEER = sneer. 'He was *smeering* at me.' Used by a labouring man of Great Torrington.—May 4th, 1884. G. M. D."

Many persons cannot distinguish *m* and *n*. Careful attention will show that servants constantly speak of the *dimin'-room*, children still oftener.

"SNAPJACKS = Stitchwort. 'Those are snapjacks.' Same authority as for 'Bittle.'—March 30th, 1884. S. R."

The common name in the West for *Stellaria holostea*.

"SNIFFY = proud. G. G., a native of Torcross, aged 82, said, May 1st, 1883, 'Her's so sniffy that a body can't stomick her.'—J. F. C."

This is equivalent to "Toss-nose," and conveys the same idea.

"SPARROW-BURDS = Wild Geranium. 'The right name for these is Sparrow-burds.' See AR-RABBITS. Same authority as for 'Bittle.'—May 26th, 1884. S. R."

Geranium Robertianum.

"SPEAR (rhymes with 'Fear') = spar, a pointed and split stick used for thatching. A labourer of Torrington, aged about 60, said, 'I was making *spears*.'—December 4th, 1882. See *Hal.* and *Wright*, 'Spar.'—G. M. D."

"SPINE = to remove carefully and thinly the grass turf. 'We spine the grass turf.' Same authority as for 'Colt's-ale.'—May 31st, 1884. S. R."

Usual through Devon and Somerset.

"SPINE-PORK. Pork from a pig weighing 70 or 80 lbs. with the spine not removed for bacon. 'Have some spine pork!' Same authority as for 'Colts'-tails.'—May 18th, 1884. S. R." Compare PORKER and BACON-FIG.

"SPINE-TURF. Grass-turf, as distinguished from peat-turf.

'We don't burn spine-turf.' Same authority as for 'Colt's-ale.'—May 31st, 1884. S. R."

Used everywhere in the West.

See *Hal.*

"Cutting on the furrow side the spine or green sward to a feather-edge, the whole of which is gradually lifted up and turned with its green side completely under."—1813. C. Vancouver, *Agriculture of Devon*, p. 116.

"STAGGERING-BOBS. Very young calves, unfit to kill. 'Veal from staggering-bobs is not wuth much.' Same authority as for 'Colts'-tails.'—May 28th, 1884. S. R."

Hal. gives this as Cheshire.

"STANDINGS = stalls, used for fairs and markets.—October 25th, 1883. G. M. D."

"STANDING (pronounced 'stannin,' rhymes with 'tannin'). A stall or accustomed standing-place in a market. While shooting a covert at Culmstock a beater tumbled into a bush, on which a farmer, native of Halberton, aged about 45, called out the common rustic pun, 'Keep your stannins, nif can't zell nort.'—January 2nd, 1884. F. T. E."

"STRAKES = strokes. A woman of this neighbourhood (Great Torrington), aged about 60, said, 'I've put five strakes on it.'—September 20th, 1883. G. M. D."

Did she mean blows, or strokes with a pen or brush? If the latter, STRAKE means 'stripe.'

"And Jacob took him rods of green poplar, and of the hazel and chestnut tree; and pilled white strakes in them, and made the white appear which was in the rods." (Gen. xxx. 37.)

"If the plague be in the walls of the house with hollow strakes." (Lev. xiv. 37.)

See also "ring-straked"—several times in Genesis xxx.

"STRONG = large. W. H., a native of the South Hams, aged 30, on December 16th, 1883, said, 'There was a strong party from the Rectory.'—J. F. C."

"STROPPY = straggling. 'It is a long stroppy village.' Same authority as for 'Adam and Eve.'—May 7th, 1884. S. R."

This is *strappy*; i.e. drawn out like a cord or strap. Called *strop* in Devon. See *Hal.*

"STUD = reverie. 'He is always in a stud.' Same authority as for 'Adam and Eve.'—March 22nd, 1884. S. R."

Hal. and Wright have: "Stud. A meditation. (West.)" Very common in Somerset; also in the expressions, "All in a brown-stud," "However I shall order, I can't think nor stud." For dropping of the final *y*, compare CAR.

"SHUGGLING ABOUT = moving about. 'The old cat was shuffling about in the hole.' Same authority as for 'Concern.'—May 28th, 1884. S. R."

"SUENT = smooth. 'I should like to see the pony's coat suent.' Same authority as for 'Bittle.'—April 12th, 1884. S. R."

Hal. and Wright. "Suent: smooth; even; regular; quiet; easy; insinuating; placid."

See also *Jennings, Williams, Pulman, Courtney, Couch, Peng*. Very common throughout the West.

Said to be from French *suivant*; but this is very doubtful. If from French at all, it is much more like *suint*, grease or yolk in wool. Hence the idea of anything lubricated so as to look or work smoothly.

"SWALING (rhymes with 'Hailing') = burning the heath and furze on a common. A gentleman, a landowner, of about 53, native of and still living at Bovey Tracy, said, 'They've been swaling the hill again.'—April, 1884. A. W. A."

"*Whanne the sunne was risen they swaliden.*"

A.D. 1382. Wyclif, *Matt.* xiii. 6.

"*Our hymeneal torch . . .*

*Dash'd with rain from eyes, and swaled with tears
Burns dim.*"

A.D. 1697. Congreve, *Mourning Bride*, act iii. sc. 6.

"*How swales that lonely shed with frankincense and myrrh.*"

A.D. 1871. Burr, *Ad Fidem*, vii. 118.

"*The candles they have tolight them to their rooms are swaling.*"

—A.D. 1881. *Pall Mall Gazette*, March 9, p. 10.

We see from the above quotations how an old word, still retained in the dialect, has dropped out of literature, and is now being again adopted by modern writers.

"SWEELING = burning furze as it stands in the ground. 'They have been sweeling here, I see.' Same authority as for 'Trim-tram.'—May 21st, 1884. S. R."

This is of course the same word as *swaling*, but differently pronounced. It is not uncommon to hear *great* pronounced *greet* by those who are a little too refined to say *gurt*.

"SY-NEED = handle of a scythe. 'This here is the sy-need.' Same authority as for 'Bittle.'—May 24th, 1884. S. R."

Personal equation for *snead*, the only known name in Devon and Somerset.

"THEREFROM = thence. 'They took it therefrom.' Same authority as for 'Bittle.' Very common. (So also 'Herefrom' for hence.)—May 13th, 1884. S. R."

Constantly used; also "Herefrom" in the West.

"THROW ABROAD (drow abroad). 'Each ploughman is to plough the part allotted to him by gathering one-third, and throwing abroad two-thirds of the 60 yards.'—Printed particulars of a ploughing match, held at Culmstock, October 31st, 1883.—F. T. E."

Applied to ploughing. Ordinary ploughs (sulls) are made to turn the soil over to the right, hence, on coming to the end of his furrow, when the ploughman turns to the left to make his return ploughing, after going to the proper distance, he "cuts in" again, and so makes the soil of his return furrow to lie off from, or in a direction away from, that ploughed in coming the other way. This is to *throw abroad*, and it follows that the last furrow ploughed in that "pitch" will be alongside that where he began, and the result of the furrows lying away from each other is that a trench is left, which is called the *all-vore*.

See GATHER, YARD.

"TIDLEY = wren. 'There is a tidley building in the moo place.' Same authority as for 'Bittle.'—May 21st, 1884. S. R." *Hal.* has "tiddy-wren, a wren. (*West.*)"

In Somerset a "tidley" is a tom-tit, not a wren.

A.D. 1802. G. Montagu, *Ornith. Dict.*: "Tidley, a name for the wren."

A.D. 1837. W. MacGillivray, *British Birds*, vol. ii. p. 408: "Golden-crested wren, tidley goldfinch."

"TILT = excitement, rage. 'Jane got into a tilt, and said, 'I will see for myself.'" Woman, 72, native and life-long resident in Stockleigh Pomeroy.—May 3rd, 1884. S. R."

Hal. has "tilt, violence. (*North.*)"

Compare the expression, "Full tilt."

"TISSERER. A North Devon farmer said, 'Well, 'tis as 'tis, and it can't be no tisserer.' He unconsciously copied Sanskrit, in which language the verb 'to be' is compared like an adjective. *Chavati taram* would be represented in Latin by *est terum*.—1884. J. F. C."

"TISSICKY, BUSSICKY. E. W., a native of the South Hams, aged 78, said, 'I'm rather tissicky, and when I come to go against a hill I get bussicky.' The former ailment would seem from this to concern the throat, and the latter to imply more deeply-seated evil.—May 1st, 1883. J. F. C."

"TIT=dot, small thing. 'A tit of a girl.' Woman, 60, lives at Cheriton Fitzpaine.—May 23rd, 1884. S. R."

Hal., "Tit, a nice smart girl. (*Var. dial.*)"

Usually, when used alone, it means a tiny thing, as in the example above, not as *Hal.* gives it.

"TITTY=small. 'A titty piece of cake.' Same authority as for 'Concarn.'—May 18th, 1884. S. R."

See *Hal.*, *Wright*. &c., "Tiny, diminutive."

"To=from or at. A labouring man of Torrington, aged about 30, said, 'He was bleeding *to* nawse,' meaning that his nose was bleeding.—December 4th, 1882. G. M. D."

"To=in. A middle-aged tradesman of Torrington said, 'I'm rather *to* a puzzle about it.'—June 7th, 1883. G. M. D."

"To=with respect to. A farmer, about 56, long residing in Culmstock parish, said to me, in reply to enquiry for his wife, 'Thank ee, sir, her's purty well to health, on'y ter'ble crippled up like.'—November 23rd, 1883. F. T. E."

"*An hors is false to helthe; forsothe he schall not be saruyd in the habundance, ether plentee, of his vertu.*"—Wycliffe vers., *Psalm xxxii.* 17.

"To Low (rhymes with 'so')=to lower. A labourer at Culmstock, aged about 40, who was doing some levelling for me, said, 'Must low thick there 'ump ever so much.'—August, 1883. F. T. E."

Common in West Somerset.

"TRAMMEL. A net attached to sliding rings on a pole, used for poaching. 'We used to go fishing with a trammel.' Same authority as for 'Colt's-ale.'—May 31st, 1884. S. R."

Well known all over the West. See *Pulman*.

"TRAVELS for walks or runs. 'How he travels!' Said of a dog, which was running very fast, by some boys of the town. Not uncommonly used by the old people of the town for walking. I have heard an old man who could not walk much from infirmity say that he could not travel well.—January 13th, 1884. W. C. L."

It is very common to hear: "Thank 'ee, I be middlin like, but I baint able to travel same's I used to;" *i.e.* to walk.

"TRIM-TRAM = lych-gate. 'There ured to be a trim-tram like this (at Tiverton) at Stockleigh.' Man, 75, born at Taunton; has lived in Stockleigh Pomeroy since he was eight years old.—April 14th, 1884. S. R."

Hal. gives "*Trim-tram* = a trifle, or absurdity."

"TRUG. My daughter heard a woman at Crediton say, 'It was as much as he could trug along with'—meaning haul or carry with difficulty.—December 6th, 1883. W. H. G."

This may mean "trudge along with;" *i.e.* carry on his back or arms; or possibly *drug*, very often used for *drag*, as in the *drug-shoe* of a waggon; or in *drug-butt*. Also in the common verb, applied to timber—to *drug* timber, being to haul it along the ground by main strength without loading it on a carriage. So also any article trailing or rubbing is said to *drug*. "Missus, yer shawl's drug-in 'gin the wheel."

"TURN = to drive; applied to cattle. 'You zee we cant turn a head o' stock over the county bounds, 'thout being a pulled up directly.' For speaker see 'Pull up.'—May 23rd, 1884. F. T. E."

This form is the usual one in East Devon. "I turn'd a cow and calf in to Tiverton; but 'twas so ter'ble slack, I turn'd 'em home again."

"UPPING-STOCK. Same as 'Lifting-stock,' *q.v.*—May 23rd, 1884. S. R."

Frequently called *hoppin-stock*, which is only a variety of the above.

"UPSIDE = equal to. 'There is no ground upside that.' Somersetshire woman, aged 55; lived in Stockleigh and neighbourhood for twenty-seven years.—May 26th, 1884. S. R."

This no doubt is "up s 'igh's;" *i.e.* "up so high as," meaning of so high a value. Not uncommon.

"VIGGING = scratching. A charwoman of Torrington said, 'The dog keeps on viggling hisself.'—November 6th, 1883. G. M. D."

"*But thof ha ded viggee, and potee, and towzee, and terree, and loustree, and spudlee, and wriggled, and pawed, and wraxed, and twined, and rattled, and teared, vig, vig, vig, vig, yeet rather than tha wudst ha enny more Champ, and Holster, and Tanbast wi' en, tha tokst en, and dest wetherly bost tha neck o' en.*"—"Exmoor Scolding," l. 215, *et. sq.*

"The old word is *fike*, of which *fidget* is the diminutive."—*Skeat*.

"To VLEX (rhymes with 'vex'). To wound a hare or rabbit. In the parish of Hemyock, a labourer, about 40, said, 'Thick rabbit was a-vlex ter'ble; I count 'll die.'—January 3rd, 1884. F. T. E."

That is, the flax or fur was knocked off by the shot.

"VORE-RIGHT (adj.) = blustering in language. A farmer (see 'Mammy-gog') said, in my presence, 'I never zeed no such change in any man as in Mr. —. He 'ont let one of his men swear nor use no rough language now; but he used to be a ter-ble vore-right man hiszul.'—May 24th, 1884. F. T. E."

See *Hal., Wright, Williams, &c.*: "Blunt, rude."

"*Not the skilled craftsmanship of Giulio Romano, not the forthright skill of Del Sarto, not the grace of Guido nor the amenities of Guercino, availed to avert the crash.*"—1884. *Athenæum*, No. 2962, p. 152.

Another instance of a good old dialect word being refined down and then adopted into modern literature.

"WHIT-POT TRADE = people of unsubstantial character, like whit-pot. 'It is only whit-pot trade that goes.' Same authority as for 'All of a dring.'—May 15th, 1884. S. R."

The making of whit-pot seems to be a lost art. Trade (see Second, Fifth, and Sixth Reports of this Committee) can be applied to all kinds of articles, persons, and animals.

Two merchants, writing on Tadmor, say, "We begun to examine what moneys we had, cloths, and other trade."—1695. *Phil. Trans. Roy. Soc.*, vol. xix. p. 136.

"WHIT-SUNDAYS = Cardamine. 'We always call them Whit-sundays.' Same authority as for 'Concern.'—May 12th, 1884. S. R."

"YARD = rod, pole, perch ; *i.e.*, five and a half square yards.
'Class 2. A prize of two guineas, or a piece of plate, to the farmer or farmer's son, living in the parish of Culmstock, and being a subscriber, or a son of a subscriber to the amount of 5s., who shall best plough sixty yards of land within a given time. The land for ploughing will be marked out and numbered, and each ploughman is to plough the part allotted to him by gathering one-third and throwing abroad two-thirds of the sixty yards, the furrows not to be less than six inches in depth, which will be taken after the third round. Time, five hours.'—From printed particulars of a ploughing match at Culmstock.—October 31st, 1883. F. T. E."

This "yard" is the only name in common use for a *perch* in the district from about Cullompton to Taunton, where it changes and becomes a "lug." As a measure of length it is now common to qualify the "yard:" a *land-yard* is 16½ feet, and a *cloth-yard* is the usual 36 inches.

"YELLOW-ARCH-ANGELS = Yellow Nettle. 'The hedge is covered with yellow-arch-angels.' Same authority as for 'Trim-tram.'—May 15th, 1884. S. R."

Lamium Galeobdolon.

This plant is very commonly known as Archangels, but just as frequently it is called Weazel-snout.

Gerard, p. 702. Of Archangell, or Dead Nettle. He calls "Yellow-archangel" *Lamium luteum*.

"Our English archangels and a few others are yellow."—A.D. 1882. *Cornhill Magazine*, January, 32.

"YOURN for 'yours.' 'There's not much difference between my daughter and yourn.' A woman, between 50 and 60, wife of a mechanic, and a resident of Teignmouth.—April 11th, 1884. W. C. L."

Most likely this was not a Devonshire woman. The form is common east of Dorset.

"ZART (rhymes with 'tart'). 'I zim hes a little zart in these place then.' Man, 60 years old, living in and a native of this parish. F. H. F."

The meaning is *soft*, stupid.

"*Nif zo be a had a had tha; a toteling, wambling, z'lottering, zart and vair yheat-stool.*"—*Exmoor Scolding*, l. 54.

SEVENTH REPORT OF THE COMMITTEE ON DEVONSHIRE FOLK-LORE.

SEVENTH REPORT *of the Committee—consisting of Mr. P. F. S. Amery, Mr. G. Doe (Secretary), Mr. R. Dymond, Rev. W. Harpley, Mr. P. Q. Karkeek, and Mr. J. Brooking Rowe—for the purpose of collecting notes on Devonshire Folk-Lore.*

Edited by G. DOE, Hon. Secretary of the Committee.

(Read at Newton Abbot, July 1884.)

THE notes received since the last meeting of the Association being so few, it was at first intended to make no Report this year; but as one of these notes was contributed by our late revered and lamented member, the Rev. Treasurer Hawker, it has been thought best to submit the present Report, notwithstanding the scanty collection following it.

The Committee venture, however, to hope that, as almost every member of the Association must occasionally witness the existence of sayings, beliefs, or customs coming within the category of Devonshire Folk Lore, many may be induced to make notes with a view to their preservation in a future Report.

G. DOE, Secretary.

“Sowing and Mowing.”—My man, bred on the border of Exmoor, said to me one day, ‘When the parson begins to read Genesis it’s time to sow black oats.’ Explanation: ‘Because they are hardy, and will stand frost and cold.’ ‘A week late in sowing makes a fortnight late in mowing.’

“J. MANLEY HAWKER, Berry Narbor, Oct. 5th, 1883.”

The following appeared in the *North Devon Herald* of the 29th May, 1884:

“NORTH MOLTON. *Holy Well.*—On Thursday last, Ascension-day, this celebrated well was as usual visited early in

the morning by suffering mortals with various diseases. Like many advertised medicines, the water is, by the simple, believed to be a cure for 'all the ills that flesh is heir to.' One lady came from Tiverton to bathe, and some from neighbouring parishes, while a few natives availed themselves of the cheap universal remedy. But, sad to relate, they went as they came; either their faith was weak, or the curative power of the water gone. Perhaps the supply of water carried home in jars by the believers will complete the cure. At any rate, the pilgrims will not lose hope and faith until this supply is exhausted, and perhaps not even then; but try to be first on next Ascension morn."

"Kitten Superstition.—A superstition has lately been brought under my notice in this way: A relative of my servant having lost her cat she was desirous of having another, and as my cat had kittens at this time the relative was advised to this effect; but she in the meantime having given up housekeeping and gone to live with a young married niece, who was expecting to add to the family circle, objected to have a kitten in the house, for, as she averred, it was unlucky to have a kitten and a baby in the house at the same time; but whether it was unlucky for the baby, or the kitten, or for the family, I was not able to ascertain.

"This would seem to be a local superstition, as I can find nothing of it in any books I have at home.

"EDWARD PARFITT."

This belief is very common in North Devon.—G.D.

"Cure for an Abscess.—I was lately informed by a middle-aged lady of Torrington that a nutmeg given to a person of the opposite sex suffering from an abscess is a certain cure.

"G. DOR."

SIXTH REPORT OF THE BARROW COMMITTEE.

SIXTH REPORT of the Committee—consisting of Mr. P. F. S. Amery, Mr. G. Doe, Mr. P. O. Hutchinson, Mr. E. Parfitt, Mr. J. Brooking Rowe, and Mr. R. N. Worth (Secretary)—to collect and record facts relating to Barrows in Devonshire, and to take steps where possible for their investigation.

Edited by R. N. WORTH, F.G.S., Secretary.

(Read at Newton Abbot, July, 1884.)

THE Barrow Committee have the pleasure of presenting an account of the investigation of two Barrows at Great Torrington, the remaining portion of a group of five, partly in that parish and partly in Huntshaw adjoining, two of which had been examined in former years by the late Mr. H. Fowler and Mr. G. Doe. Though no additional light has been thrown upon the questions of the age of the Barrows and the race of their builders, the results are so far satisfactory that the whole group may be presumed to have had a kindred and probably contemporaneous origin; which previous discoveries would seem to assign to an early period of the Bronze Age.

The Committee may add that, in the new Ordnance Survey of Devon, all mounds of a sepulchral or presumably sepulchral character will be distinguished by the general term *tumulus* or *tumuli*.

J. BROOKING ROWE, Chairman.
R. N. WORTH, Secretary.

BARROWS AT HUNTSHAW AND GREAT TORRINGTON.

IN addition to the two barrows in the parish of Huntshaw which were examined in 1867 and 1875, and accounts of which are given in volumes ii. and vii. of the *Transactions*

of the *Devonshire Association*,* there are three others forming part of the same group, but in the adjoining parish of Great Torrington. One of them, by far the largest of the five, is crossed by the road leading from Torrington, so that its complete examination would be a task of considerable difficulty. The remaining two, however, are situated in a field about a quarter of a mile to the south-west of the Huntshaw Barrows previously reported.

At the commencement of June, in the present year, Mr. Gabriel Fisher and Mr. McKelvie, together with my father, Mr. G. Doe, and myself, proceeded to examine these tumuli. They are about 100 feet apart, and by continued agricultural operations have been considerably reduced in height, being now respectively about 4 feet and 2 feet high only; while the diameter of each at the base is 42 feet. Investigating in the manner taught by previous experience we commenced operations by sinking a crowbar into different parts of the higher of the two mounds, and were soon rewarded by meeting with a heap of stones, on the south side of the barrow, about five feet from the centre. The workmen were then set to remove the soil around this buried cairn, and we found it to be of an oblong shape, about 17 feet long, 10 feet wide, and 2 feet high. It was composed of common "acre" stones, amongst which we found considerable quantities of wood charcoal. Under the stones was a small mound of clay, which apparently lay on the undisturbed ground. On the top of the clay was a flat stone. This was removed amidst considerable excitement on the part of the workmen, who stated that in their opinion we had at last come upon the "crock of gold." They were, however, grievously disappointed on finding only a round hole in the clay, about a foot deep, nearly filled with wood charcoal, and containing a few very minute pieces of burnt bone.

We then proceeded thoroughly to examine the rest of the barrow, but did not succeed in finding anything further. The general internal structure was of clay, interspersed with layers of very fine charcoal, and it was covered with common soil to the depth of a foot. There was a layer of stones around the lower part of the mound, which may have been the remains of such a stone capping as that found in the first barrow opened by Mr. Fowler.

The other barrow, which seemed to have been lowered at

*"On the Opening of an Ancient British Barrow at Huntshaw." By H. Fowler. *Trans. Dev. Assoc.* vol. ii. pp.187-189. "The Examination of Two Barrows near Torrington." By George Doe, *ibid.* vol. vii. pp. 102-105.

some early period of its existence, is different in construction from its neighbour; but, owing to the rough weather and other causes, we were unable to make so thorough an exploration as we could have wished. We had to content ourselves, therefore, with excavating a large space in the centre, and driving trenches therefrom to the circumference. No trace of stones of any kind was discovered in any part of this barrow. It seemed to be formed of clay and earth, with charcoal intermixed; the clay being occasionally met with in large lumps amongst the soil. Near the centre we came upon a layer of about six inches of dark sooty matter, but could not distinguish any pieces of charcoal therein. A little distance from this, however, we found some very large pieces, mixed with clay.

The absence of pottery of any kind, and the similarity of construction in the mixture of clay and charcoal, seem to lead to the inference that these Great Torrington Barrows were made about the same time as, or perhaps somewhat earlier than, the Huntshaw members of the group previously examined.

GEORGE M. DOR.

FIFTH REPORT OF THE COMMITTEE ON WORKS OF ART IN DEVONSHIRE.

FIFTH REPORT of the Committee—consisting of the Right Hon. Lord Clifford, Messrs. R. Dymond (Secretary), A. H. A. Hamilton, (the late) Rev. Treasurer Hawker, G. Pycroft, and Mr. R. N. Worth—appointed to prepare a Report on the public and private collections of Works of Art in Devonshire.

(Read at Newton Abbot, July, 1884.)

THE Committee have again the sorrowful duty of announcing a vacancy caused by death in their small body. As a tribute to the memory of their genial and valued colleague, the Rev. Treasurer Hawker, will appear in another page of this volume, the Committee simply record their deep regret at the loss of one who took a warm interest in their work, and who, but for the illness which stayed his active pen, would have contributed to the pages of this Report.

As it is desirable to increase their working strength, the Committee desire to be at liberty to invite Dr. Brushfield, Mr. Arthur Champernowne, and Mr. John Shelly to join their body.

In the present Report will be found a continuation of the descriptive account of works of art preserved in the public buildings and places of Exeter, of which last year's Report contained a part, dealing with those at the Guildhall and at the Devon and Exeter Institution. To this are now added complete and detailed catalogues of the paintings and sculpture at the Bishop's Palace, the Devon and Exeter Hospital, the Workhouse and Offices of the Corporation of the Poor, the Grammar School, the Albert Memorial Museum, the Castle, the Hall of the Vicars' College, and on Northernhay, and other public places in Exeter. When the monumental sculpture in the Cathedral and other city churches shall have

been similarly dealt with, the volumes of our *Transactions* will contain by far the most complete account that has been published of the public treasures of art in the Cathedral city.

The Committee hope to present a similar view of the public collections in the various boroughs of the county.

Indeed some progress has already been made in this direction; for appended to this Report will be found notices of portraits of public men in the townhalls of Barnstaple, Torquay, Tiverton, and Torrington.

The Secretary has again been greatly assisted in the work in Exeter by Mr. Sidney T. Whiteford, whose large experience and critical knowledge of art have proved invaluable. Mr. J. R. Chanter has contributed notes on the Barnstaple collections; whilst Mr. H. S. Gill, of Tiverton, and Mr. George Doe, of Torrington, have furnished information on the portraits in the townhalls of those boroughs. For the accounts of the valuable collections at Wear House (Sir J. Duckworth's) and Great Fulford (Mr. F. D. Fulford's) the Committee are indebted to the ever-ready aid of their colleague, Mr. G. Pycroft; whilst Mr. R. N. Worth, another member of the Committee, has supplied notes on the Drake statues at Tavistock and Plymouth.

CLIFFORD, Chairman.

ROBERT DYMOND, Hon. Secretary.

AT THE EPISCOPAL PALACE, EXETER.

The series of thirteen portraits of Bishops of Exeter, now hung in the hall of the Palace, was briefly referred to in the Second Report of the Committee, read at Totnes in 1880. The following is a more detailed account of this interesting collection. Where not named, the artist is unknown:

DAHL, MICHAEL, Stockholm, 1656. Resided in England from 1688 until his death in 1743.

Ofspring Blackall, son of Thomas Blackall, Alderman of London. Consecrated 8th February, 1708. Died 29th September, 1716, aged 66.

Three-quarter length. Life-size. Oil on canvas.

Seated; nearly full face; the eyes looking at the spectator; light from left. Apparent age, about 60. Costumed in episcopal lawn and cassock. Own long grey hair. Both hands are shown; the right resting on the arm of chair; the left on a table. Dark plain background. Two other portraits of this bishop, in the possession of his lineal descendant, Thomas Blackall, Esq., of Exeter, will be separately described. The flesh-tints have become

unpleasantly dark. The face wears a look of determination, and has some dignity. This picture is a rather good example of the artist's work, which is only moderately esteemed.

ZEEMAN, ENOCH. A native of Holland; long resident in London, where he died, 1744; his brother Isaac in 1751.

Lancelot Blackburne. Succeeded Bishop Blackall 24th February, 1716-7. Translated to York 28th November, 1724. Died 1743, in London.

Three-quarter length to knee. Life-size. Oil on canvas.

Seated in easy-chair; nearly full face; the eyes looking at the spectator; light from left. Clad in episcopal robe, and short powdered wig, full at the sides. Both hands shown; the right elbow rests on the arm of the chair, the hand being advanced, and the forefinger extended to accompany the act of speaking. On the left of the figure are the words, "Lancelot Blackburne. Cons. March 19. 1716." Dark plain background. This is apparently a replica, with slight variations, of the portrait by Zeeman, of which an engraving by G. Vertue (1727) hangs in the dining-room. The picture is well drawn and posed, but the flesh-tints are waxlike and monotonous. The expression suggests irritability rather than dignity, and the hands have none of the marks of age, which would make them harmonize with the worn countenance. The picture is, however, a good example of Zeeman's style.

HUDSON, THOMAS. *Ante.*

Stephen Weston. Succeeded Bishop Blackburne 27th December, 1724. Died 8th January, 1741-2, aged 76.

Three-quarter length. Life-size. Oil on canvas.

Seated in arm-chair; head and figure turned to left; the eyes regarding the spectator; light nearly direct. Costumed in episcopal robes, and dark flowing wig. The right arm rests on a table, the hand hanging over its edge; the left hand holds on the lap a closed crimson-bound book. Plain dark background. A well-arranged picture, of considerable merit, though not equal to other pictures by Hudson preserved in Exeter. The firmly-closed lips, and the elevated and strongly-defined dark eyebrows, give a somewhat haughty and cynical expression to the intelligent countenance.

John Gauden. Consecrated Bishop at the Restoration, 2nd December, 1660. Translated to Worcester 10th June, 1662. Died 20th September, in the same year, aged 57.

Half length. Life-size. Oil on canvas.

This is the earliest portrait in the collection. Face turned slightly to right; light direct. Costumed in dark robes, scarcely distinguishable from the background; his own full grey locks hanging down on either side from a black skull cap; a thin

moustache. Plain white bands below the chin. The well-known controversy respecting the authorship of the famous *Eikon Basilike* invests this portrait with exceptional interest. The character of Bishop Gauden has been sharply criticised by various writers. It is frequently said that neither his character or intellect supports the theory that makes him, and not King Charles himself, the writer of the affecting "Portraicture of his sacred Majestie in his Solitude and Sufferings." The refined and handsome features here represented indicate marked intellectual power, with some hint of subtlety. Hume speaks of the known works of Dr. Gauden as in style "bombastic, perplexed, rhetorical, and corrupt; whilst the *Eikon*," he observes, "must be acknowledged as the best prose composition which, at the time of its publication, was to be found in the English language."

George Lavington, LL.D. Consecrated Bishop 8th February, 1746-7. Died 13th September, 1762, aged 79.

Half length. Life-size. Oil on canvas.

Face turned slightly to right; light direct; the eyes look at the spectator. In episcopal robes, and full white wig. Plain dark background. On the canvas is painted the bishop's name, "George Lavington, LL.D.," with the dates of consecration and death as above. The comfortable figure and gross features suggest the reverse of "plain living and high thinking."

The Hon. Frederick Keppel. Succeeded Bishop Lavington 7th November, 1762. Died at Windsor (where he was Dean) 27th December, 1777, aged 49.

Half length. Life-size. Oil on canvas.

Three-quarter face turned to right; light direct, and concentrated behind the head of the figure; eyes looking out from the canvas, but not directly at the spectator. In full episcopal robes, with badge of Registrar of the Garter. Plain dark background. Over the figure is the following painted inscription, "Honorable Fred: Keppel Fourth son of William Anne Earl of Albemarle. Bishop of Exeter and Dean of Windsor. Born Jan^r 30. 1729. Consecrated Bishop of Exeter Nov. 7. 1762. Died Dec. 27. 1777." This is the portrait of the bishop who was the butt of the witty but scurrilous Dr. Wolcot (Peter Pindar), whose unseemly scandals must have found unfortunate support in the jovial and homely appearance of the bishop. As a work of art, it is one of the best pictures in the collection.

John Fisher. Consecrated Bishop 24th July, 1803. Translated to Salisbury 20th July, 1807. Died in London 8th May, 1825.

Half length. Life-size. Oil on canvas.

Seated in a crimson chair, of which the upper part of the back alone is visible above the shoulders. Full face and figure to spec-

tator; eyes to right; light direct. The figure clad in episcopal robes, with the badge of Chancellor of the Garter, and wearing a small close-fitting white wig. Plain dark background. Although the head is well-drawn and painted, and the features express intelligence and worth, this picture has little artistic merit.

Seth Ward. Succeeded Bishop Gauden 20th July, 1662. Translated to Salisbury 12th September, 1667. Died at Knightsbridge 6th January, 1688-9, aged 72.

Half length. Life-size. Oil on canvas.

This, the second of the portraits in order of date, is painted on an oval, within a square frame. The face almost fronts the spectator, the head being turned slightly to the left; the eyes regarding the spectator; light direct. Costumed in episcopal robes, with a square black cap over his own brown hair. In the upper left corner are the arms of the See impaling Ward—*Azure, a cross fleurée, or.* Plain dark background. Commonplace in treatment. Engravings give a higher idea of the personal appearance of this once eminent divine.

Anthony Sparrow. Succeeded Bishop Seth Ward 3rd November, 1667. Translated to Norwich 18th September, 1676. Died there 18th May, 1686.

Bust. Life-size. Oil on canvas.

An upright oblong painting, representing the subject in episcopal robes and peculiar flat cap; own wavy dark hair, and very slight moustache; face to right; light from left. Dark plain background, in left upper corner of which is a shield containing the arms of the See impaling Sparrow—*Ermine, three roses arg. seeded, or.* Of this portrait a small line engraving was published in 1798 by W. Richardson, printseller, Strand. A picture of little pretension as a work of art; probably a good likeness, the handsome features displaying evident individuality.

Sir Jonathan Trelawny. Born 1650. Translated from Bristol 1688. Died at Chelsea 19th July, 1721.

Half length. Life-size. Oil on canvas.

This distinguished Cornishman, one of the seven bishops committed by James II. to the Tower, and the subject of the well-known ballad, is portrayed apparently standing, in full canonicals and ample flaxen wig; the whole figure much lowered in tone; light direct; full face; the eyes regarding the spectator. Plain dark background. The features, although not suggestive of high intellectual power, indicate such firmness of character as this eminent opponent of royal aggression is known to have possessed. The head is fairly well drawn and painted, but the general treatment affords no evidence of high artistic ability.

John Ross, F.R.S. Born at Ross 25th June, 1719. Succeeded Bishop Keppel 25th January, 1778. Died at the Palace, Exeter, 14th August, 1792.

Half length. Life-size. Oil on canvas.

Seated in episcopal robes, with short bushy powdered wig; face nearly full; eyes regarding the spectator; light from left. Dark plain background. The whole picture has darkened very much. The small head, sunk between the shoulders, the expression, and pinched features, suggest infirmity and a querulous nature. As a work of art the portrait has little that can be commended.

WOOLNOTH, J. A.

Henry Phillpotts. Born at Bridgewater 6th May, 1778. Succeeded Bishop Bethell 22nd November, 1830. Died at Bishopstowe, Torquay, 18th September, 1869.

Three-quarter length. Life-size. Oil on canvas.

The only one of the series portrayed without canonicals. Seated in high leather-backed arm-chair; three-quarter face; light from left; eyes looking out from the picture, but not at the spectator. Dark ordinary clerical costume, with episcopal apron. The right hand, resting on the lap, holds the corner of a paper; left arm on the arm of chair, the hand hanging over its end. A small portion of a table shown near the right elbow. This picture, an undoubted likeness, and displaying good qualities of drawing and composition, is yet highly unpleasing, giving but a partial reading of the character of the eminent man who is still remembered by so many. The flesh-tints have paled into an almost death-like hue, and the expression is one of cold and harsh intellectuality. Engraved by W. Walker in 1851.

REYNOLDS, SAMUEL WILLIAM, chiefly known as an engraver. Born 1773. Died at Bayswater 1835.

William Carey. Consecrated 12th November, 1820. Translated to St. Asaph 7th April, 1830. Died in London 13th September, 1846, aged 77.

Half length. Life-size. Oil on canvas.

Seated in canonicals, and wearing full grey wig; face slightly to left; light nearly direct. Part of back of chair visible over the right shoulder. The right hand rests on the knee. Crimson curtain on background, showing small plain space to right. A pleasant portrait, artistically treated, in the style which Sir Thomas Lawrence has made so familiar, and in which courtly grace prevails over distinctive display of intellect or character. This picture is in a bad state, and greatly needs careful cleaning and re-varnishing. A small line engraving, by T. A. Dean, was published by Fisher, Son, and Co., London, in 1830, and was copied no doubt from the fine mezzotint by S. W. Reynolds, sen., father of the artist.

DEVON AND EXETER HOSPITAL, EXETER.

Few public institutions are so fortunate as to possess a collection of portraits of such high average merit as these valuable memorials of eminent supporters of this Hospital. If the persons represented enjoyed little more than a local reputation, their work was not less valuable than that of many whose names have a place in our national history, whilst their portraits, with scarcely an exception, display such qualities as must render them interesting to all who appreciate masterly artistic work.

HUDSON, THOMAS. *Ante.*

John Tuckfield, Esq., M.P. for Exeter 1745-66.

Three-quarter length. Life-size. Oil on canvas.

This portrait differs in details from that in the Exeter Guildhall, described in last year's Report. The figure stands erect, slightly turned towards the left, but the face directly fronts the spectator. The light falls from the right. Dress, an olive-coloured velvet coat, with gilt buttons, and long white satin waistcoat, both untrimmed. Beyond the deep cuffs extend small ruffed wrist-bands. The right hand holds the deed by which Mr. Tuckfield gave the site for the Hospital, on the 22nd of September, 1741. The left is thrust into the breeches pocket, causing folds in the lower lappets of the satin waistcoat, and disclosing the hilt of a sword. A good example of Hudson's style, although the head seems unnaturally small. The coat and waistcoat, probably painted by his assistant, Vanhaaken, are finished with remarkable care and success.

WILLS, JAMES, originally a painter, but afterwards rector of Little Stanmore, Middlesex. Died 1777.

Alured Clarke, D.D. Appointed Dean of Exeter, 1740.

Died 31st May, 1742.

Three-quarter length. Life-size. Oil on canvas.

The dean is represented at about the age of 40, sitting in a red-backed arm-chair. The light falls from the left on a full face, of somewhat youthful expression, inclined to the left of spectator, the eyes being still more inclined in that direction. The right hand, hanging over the arm of the chair, holds a book, kept open (as if for further reference) by the forefinger. On the right is a table, on which is laid a sheet of white paper. The figure is habited in black gown, with falling bands, and powdered wig just reaching to the shoulders. The dean laid the foundation-stone of the Hospital on the 27th of August, 1741, and may be regarded as its joint

founder with Mr. Tuckfield. An interesting portrait, in style resembling Hudson's work. The hands absurdly feminine, but good in colour, and not ill drawn. A portrait of the dean by Wills, engraved by or for "W. Haskoll, of Winton," differs in several particulars from the Hospital portrait.

HUDSON, THOMAS. *Ante.*

*Michael Lee Dicker, M.D. Born 23rd December, 1693;
died in Exeter, 3rd October, 1752.*

Three-quarter length. Life-size. Oil on canvas.

One of the five physicians appointed on the foundation of the Hospital in 1741. Nearly full face to right; light from left; seated, with left arm resting on table, on which are inkstand, pen, and paper, and over the edge of which the hand hangs down; right hand on arm of chair; full plain white wig falling over shoulders; snuff-coloured suit, under an olive-coloured overcoat; white cravat. An excellent work. The head admirably drawn and modelled, and highly finished. The flesh-tints clear and natural; the general colour good; the features full of expression.

HUDSON, THOMAS. *Ante.*

*Ralph Allen, Esq., Philanthropist (the original of Fielding's
"Squire Allworthy"). Died 1764, æt. 71.*

Three-quarter length. Life-size. Oil on canvas.

A standing figure, inclined to right, painted in 1759, representing the owner of Prior Park, Bath, habited in plain light-brown suit. The extended fingers of the left hand rest on a paper laid on a table; the right hand hangs idly in front. The head is covered by a powdered wig, of a kind similar to that seen in the portrait of Dr. Dicker, by the same artist. Light from the left. The simple dignity of the action and position, the expressive countenance, and the technical qualities, make this a very interesting picture. In spite of a certain tameness in handling which characterizes all his works, this portrait, with that described above, would alone suffice to show that Hudson was an artist of uncommon ability, and that he merits more consideration than has been allowed to him by critical writers, since his fame was eclipsed by the splendid attainments of his pupil Sir Joshua Reynolds.

GANDY, WILLIAM. *Ante.*

*John Patch, senr. Born 1691. Appointed surgeon to the
Hospital, 1741. Died 11th May, 1746.*

Three-quarter length. Life-size. Oil on canvas.

A standing figure, full faced, and apparently under 40 years old, painted as in the act of delivering an anatomical lecture. Light

from left. Dark brown coat. On a table on right, and covered by a white cloth, is shown part of an instrument (apparently an injection syringe) under the lower portion of a human arm, with muscles laid bare. The left hand, hanging over a book, appears to point to an exposition of the subject. The right hand holds a scalpel. The head is covered by a wig of long-flowing and unpowdered locks. The unbuttoned waistcoat discloses the shirt loose at the throat. A fine picture, both for composition and handling. The attitude is easy, yet dignified. The aristocratic countenance wears a pleasing expression, and suggests intellect and refinement. The left hand has suffered by abrasion. The date, 1783, inscribed on the frame, must be an error. It evidently applies to the portrait of the younger Patch.

OPIE, JOHN, R.A. *Ante.*

Thomas Glass, M.D. Died 5th February, 1786, aged 76.

Three-quarter length. Life-size. Oil on canvas.

One of the five physicians appointed on the foundation of the Hospital, 1741, and resigned on the 12th January, 1775. The figure is seated, nearly full face, inclined to left, in a chair, on the arm of which the left hand rests. The right hand grasps a gold-headed cane, planted firmly down in a vertical position. The figure is habited in plain black suit, over which hangs loosely a doctor's scarlet robe; powdered wig, with side bunches over ears, as the fashion was; full features, the double chin resting on a white cravat, but little of which is visible; frills at wrist. Light from left. This portrait was admirably engraved in the stipple style by Ezekiel, of Exeter, in 1788. A capital picture; the head firmly modelled, and full of character; the colour rich, though subdued; the light and shade and general treatment vigorous; hands inexpressive, and inferior in power to the rest of the work. A gilt tablet below the frame describes the eminent professional merits of Dr. Glass, and states that "the medical faculty of Exeter have placed his portrait in this Hospital, of which he was one of the physicians 30 years, 1783." It was probably painted in 1781. Engraved by E. A. Ezekiel, of Exeter, 1788.

OPIE, JOHN, R.A. *Ante.*

*John Patch, jun., Esq. Born in Exeter, 1723;
died December, 1786.*

Bust. Life-size. Oil on canvas.

Probably painted in 1781, when Mr. Patch was about 60 years old. Light from the right. The face turned slightly to right; light brown coat; the powdered wig is full at the sides, as in the portrait of his father; firmly drawn, and solidly painted, but rather sombre in colour. The treatment is simple and appropriate to the gravity

of character indicated by the form of the head and strongly-pronounced features. Mr. Scharf regarded this as "an excellent portrait, rich and mellow in colour, and full of character." It was engraved by Ezekiel, in 1789. Mr. Patch was one of the four surgeons appointed on the foundation of the Hospital in 1741, being then in his nineteenth year. He evinced high professional talent, and was an able mathematician and classical scholar.

KEENAN, J. Practised in Exeter 1794-9. Died about 1815.

John Sheldon, F.R.S. Born about 1752; died 1808.

Three-quarter length. Life-size. Oil on canvas.

Mr. Sheldon was appointed surgeon to the Hospital in 1797. He had attained great distinction in London, but retired to Exeter owing to a mental infirmity, from which he recovered for a time. He is represented with face and body turned slightly to right, seated in red arm-chair, and clothed in plain black costume, holding in the left hand a paper, the contents of which he appears to be expounding to an audience. The right hand rests carelessly on the knee in front. On a table to left are a glass jar and globular vessel. Dark background, on which a red curtain is barely distinguishable. The light falls from the left. The pose and arrangement are good. The drawing and colouring display considerable knowledge and feeling; but the outlines of the features are so softened as to appear almost blurred, and out of keeping with the general handling, which is vigorous.

REINAGLE, RAMSAY RICHARD, R.A. Born 1775. Died at Chelsea, 1862.

John Blackall, M.D. Born 1771. Died 1860.

Half length. Life-size. Oil on canvas.

Seated, and habited in ordinary black costume, with frilled shirt-front. The face, turned slightly to left, has a dark red curtain for background, with glimpse of landscape at the side. The right hand is unseen; the left, resting on a table, holds a paper roll; light from right. A duplicate of this picture is in the possession of Thomas Blackall, Esq., M.D., now of Exeter, and only surviving son of the original. They were probably painted about the year 1850. The engraving by Cousins is more agreeable as a work of art than the painting. The red curtain, introduced to lessen the ruddy tones of the flesh, fulfils its purpose, but is unpleasantly positive in hue. Dr. Blackall, great grandson of Bishop Ofspring Blackall, was first elected a physician to the Hospital 1st June, 1797, but resigned 28th August, 1801, on his removal for a time to Totnes. He was re-elected on the 25th June, 1807, and resigned 14th October, 1847, when the vacancy was filled by the election of Dr. Thomas Shapter, who had married his niece.

KNIGHT, JOHN PRESCOTT, R.A. *Ante.*

Thomas Shapter, M.D., F.R.C.P., LL.D. Born at Gibraltar, 1809.

Half length. Life-size. Oil on canvas.

Full face regarding spectator; seated in a dark arm-chair; light nearly direct, but slightly from right. Dark background; ordinary black costume, the arms resting on those of the chair, and the hands folded in front. The portrait is signed and dated 1847. The flesh tints are too low in tone for a quite satisfactory effect; but the drawing and modelling are skilful, and the pose of the figure natural and easy. Dr. Shapter, a member of a family long settled in Exeter, took up his residence there in 1831, and was elected a physician to the Hospital on the 4th November, 1847, on the retirement of Dr. Blackall, whose niece he had married. He resigned the office July 19th, 1877. This portrait was presented to the Hospital in 1882 by his son, Dr. Lewis Shapter.

MOGFORD, THOMAS. *Ante.*

Samuel Barnes. Born 1784. Died 1858, in Exeter.

Half length. Life-size. Oil on canvas.

Seated, in black costume; the face supported by the left hand; the left elbow resting on a table, whereon are laid two closed books supporting a third, which is open, and from the perusal of which the subject has apparently looked up for a moment. The light is from the left. The darkening of the background has brought the well-painted head into somewhat harsh relief. A portrait and bust of this eminent surgeon at the Devon and Exeter Institution were described in last year's Report. He was appointed a surgeon to the Hospital 13th July, 1813, and resigned 3rd September, 1846.

Patrick Miller, M.D. Born 1782. Died 1871.

Half length. Life-size. Oil on canvas.

This portrait, painted in 1818, represents the doctor seated, with table before him, on which rests a book, kept open by the hands; dark red curtain in background; plain black costume; light from left. Apparently with a view to avoidance of spottiness by repetition of small lights, the hands have been lowered in tone to a degree beyond what was necessary or consistent with truth. In other respects this is a good and expressive portrait, treated with much technical ability. Dr. Miller, eldest son of Rev. Thomas Miller, D.D., minister of Cumnock, Ayrshire, was born 21st May, 1782, M.D. 1804, and came to Exeter 1807. Was elected a physician to the Hospital 28th December, 1809, and resigned 26th January, 1860. He died at his residence, The Grove, Mount Radford, Exeter, 24th December, 1871.

LEAKEY, JAMES. *Ante.*

John Haddy James, F.R.C.S. Painted 1843.

Half length. Life-size. Oil on canvas.

Seated in red arm-chair by a table on right, covered with cloth of the same colour; light from left; face slightly to right, and resting on the left hand, with elbow on table; the right hand resting on arm of chair; ordinary black costume of the middle of the 19th century; background a plain half light. The least satisfactory of all the portraits. Common-place in pose and treatment; poor in colour, and weakly modelled. Mr. James was a native of Exeter. As assistant surgeon of the 1st Life Guards he was present at the battle of Waterloo. He was appointed a surgeon of the Hospital 11th June, 1816, and resigned 2nd September, 1858.

STEPHENS, E. B., A.R.A. *Ante.*

John Bowden Creswell, Esq., of New Court, near Exeter.

White marble bust in niche. More than life-size.

The sculptor's name, in full, is cut in a fold of the drapery behind, with the date 1849. This bust has all the simple truthfulness and power which characterize the works of this eminent artist. In front is an inscription in incised and gilded letters, showing that this bust and £70,000 were bequeathed to the Hospital by Mr. Creswell's daughter, Mrs. Mary Halford, who died 13th May, 1852.

The foregoing are all in the Board Room, the following in the Consulting Room, of the Hospital:

Artist unknown.

John Sheldon, F.R.S. Ante.

Three-quarter length. Life-size. Oil on canvas.

This portrait, presented by James Goss, Esq., is a replica, with variations of detail, of the one in the Board Room, and is in some points a finer work, though inferior in general arrangement. It is worthy of better treatment than it has received. The light is from the left; the eyes look out to the right from the fine expressive face, which is turned slightly in the same direction. The figure is seated in a red arm-chair, the left hand holding a book; whilst the right rests on the lap; own powdered white hair. On a table on the left are a glass bottle and *ecorché* plaster human figure. In the background, to right, are a pillar and looped red curtain; the crossed legs compose very awkwardly, and the patches of red and black, resulting from the position of the limbs clad in black against the red back and seat of the chair, are very inartistic and unpleasant. These defects are the more surprising as the head and hands are painted with real ability. This picture urgently needs restoration. A large hole in the lower part, to right, and other injuries, indicate treatment from which its merits should have protected it.

Artist and subject unknown.

Half length. Life-size. Oil on canvas.

The subject of this portrait is apparently of about the age of fifty; nearly full face to left, the eyes looking in the same direction; own white hair, unpowdered, but tied in a *queue* with black ribbon; plain dark dress of the early part of the 19th century; light from right. In the background a dark red curtain, looped on left, over an anatomical plaster human figure, and part of a scull. The handling shows dexterity born of practice, but the style and colouring are poor and tricky, and the painting thin. In the upper portion of the face the pigment is blistered and almost detached from the canvas; restoration is urgently needed.

Artist and subject unknown.*A young man apparently about 25 years of age.*

Half length. Life-size. Pastel on paper.

Seated at a table covered with blue cloth; three-quarter face to left; own long unpowdered hair. The red-brown coat is secured by a single button in front over a grey-striped jean waistcoat. The left arm is not shown below the shoulder; the right elbow rests on the table; the hand, frilled at the wrist, raised to the level of the eyes, holds a glass bottle containing some anatomical preparation, which the subject is attentively contemplating. The light falls from the right; the modelling of the face has been much injured by rough treatment, parts of the features having been wiped away; but the general character can still be traced sufficiently to make the work interesting, and to show that it was produced by no mean artist.

AT THE OFFICE OF THE CORPORATION OF THE POOR, EXETER.

All the portraits of this series, excepting those of King William, and of Canon John Bury, are remarkably alike in style and colouring. The flesh-tints hot, inclining to brick-red; the shadows heavy, foxy; yet all show vigour in handling, and considerable artistic knowledge.

King William III. (over the Governor's chair).

Three-quarter length. Life-size. Oil on canvas.

Nearly full face, turned slightly to right; the eyes looking at the spectator; light from the right. The king is in a complete suit of armour. Sinister-wise across the breast is the blue ribbon of the Garter, and round the waist a heavy gold embroidered sash, below which is seen the gold hilt of a sword. The neck is enveloped in a thick cravat, the ends of which are thrust under the

breastplate. The locks of a full-flowing, dark wig fall on the shoulders. The right hand holds a *bâton*, the arm being raised; the left hand rests on a table, the fingers passing over its edge. On this table, to right, is placed a helmet, surmounted by a plume of white feathers. In the background of the figure is a mass of rock in shade, disclosing, on the left, a cavalry charge by a river—probably the battle of the Boyne. The Workhouse was founded in the reign of this king, pursuant to an Act of Parliament passed in 1699. Hard and poor in style; the action awkward and theatrical; the head too large in relation to the figure, to which armour, over the thick underclothing necessarily worn, in reality always gave an appearance of rather disproportionate bulk. The likeness is good, and the picture historically interesting, though not a fine work of art.

Colonel John Bury.

Half length. Life-size. Oil on canvas.

Three-quarter face to right; looking at the spectator. Large, dark, flowing wig, as in the above-mentioned portrait of William III. The figure in armour, over the front of which the ends of the cravat fall. Light almost direct, but slightly from the left; plain dark background. Colonel Bury was a Parliamentary officer, and son of Canon John Bury, whose portrait is in the same room. A burly figure, with well-proportioned though bluntly-modelled features, and a general look of vigour and good temper.

*Ralph Mitchell. Architect of the Exeter Workhouse, 1699
(over door).*

Half length. Life-size. Oil on canvas.

Nearly full face, turned slightly to right; eyes regarding the spectator. Dark flowing wig, and heavy folded cravat. The right arm and shoulder covered by the folds of a loose brown cloak; the left hand holds a paper roll, on which appears a plan of the buildings of the Workhouse in their original form. Light from left; plain dark background. A poor though not a bad picture; the features large and rudely rather than incorrectly drawn; the eyes expressionless. The handling is good.

*Canon Arthur Bury, D.D. Prebendary of Exeter, 1661,
and Rector of Exeter College, Oxford.*

Half length. Life-size. Oil on canvas.

Nearly full face, turned to right; the eyes looking at the spectator. Very large grey flowing wig; the hair parted in the middle. Falling cambric cravat. The right arm concealed by the folds of a black gown. Light from the left; plain dark background. Canon Arthur Bury was a son of Canon John Bury, mentioned hereafter. The treatment shows some power, but no refinement; the drapery skilfully cast and well painted.

Sir Thomas Bury, Knt. Merchant of Exeter.

Half length. Life-size. Oil on canvas.

Three-quarter face to left; the eyes regarding the spectator. Full, flowing, dark Ramilies wig falling over the shoulders. The ends of a heavy, loosely-folded cravat fall over the armour in which the figure is clad. Light from right; plain dark background.

GANDY JAMES (?). Exeter, 1619. Ireland, 1689.

(Over mantel-piece). *Canon John Bury, D.D. Prebendary of Exeter, 1632.*

Half length; oval within a square. Life-size. Oil on canvas.

Nearly full face, turned slightly to left; on the head a close-fitting black skull-cap; thin white hair and whiskers, and white moustache and short square-cut beard; the figure habited in black gown and cassock, with portion of white neck-collar showing on right; light almost direct. Plain dark background. In the upper right corner is "Etat 86," and in the left "Ano 1664." Dr. Bury, born at Tiverton 1580, was Rector of St. Mary Major, in Exeter, and founder of the old Workhouse at the bottom of Paris Street, in that city. He died on the 5th, and was buried in the cathedral 9th July, 1667. This portrait was the gift of his son, the before mentioned Canon Arthur Bury, and was placed in the workhouse in 1705. It is conspicuously the best of the series, and is a work of high quality; and from such evidence as the action and painting of the hand, the clear tones of the flesh, and general treatment, may be accepted as the work of a pupil of Vandyke, and may, with every probability, be ascribed to James Gandy. It is well preserved on the whole; but the side of the face, to left, shows two red patches, apparently the result of injuries and attempted restoration.

Besides the paintings the Board-room contains a careful black crayon drawing of *Paul Micheau*, a celebrated organ builder of Exeter, who died 1824, *æt.* 89. It is of less than life-size—a half length, on an oval within a square frame; light from the left.

IN THE CHAPEL OF EXETER WORKHOUSE.

GANDY JAMES (?). *Ante.*

Sir John Elwill, Knt. and Baronet. Merchant of Exeter. Sheriff of Devon 1694. Died 1717.

Full length. Life-size. Oil on canvas.

Standing on dark boarded floor; nearly full face; the eyes regarding the spectator; light nearly direct, but somewhat from the right; red aldermanic (?) robe; dark flowing wig and white falling bands under the chin; a light-brown moustache and imperial. The left hand rests on a plain wooden table on the extreme right;

the right is placed extended on the breast. A portion of the dark background on the left is lighted by an unseen window. This is the wreck of a fine picture, probably by the elder Gandy (James). It merits, and is not beyond the reach of, careful restoration. The red of the robe is of fine quality; the hand on the breast is in Vandyke's manner, as are the carnations of the well-drawn countenance.

GANDY, WILLIAM. *Ante.*

Sir Edward Seaward, Knt. Mayor 1691.

Full length. Life-size. Oil on canvas.

Standing on a pavement of black and white marble squares; three-quarter face to right, under a dark flowing bushy wig; the light from the left. The knight wears his red fur-edged robe as mayor, but no chain; his left hand holds a paper; the right hand, in a dark brown glove, rests on the hip. The dark architectural background has an arched opening to right, from which hang a curtain, cord, and tassel. A distant landscape is seen through the opening. On the left is a table covered with brown cloth, on which is placed a helmet, with the vizor up. On an upright tablet, in the lower right corner, can be read, "1702. This picture was made and given by Mr. Wm. Gandy." Almost an imitation of the preceding, but very inferior, coarse and carelessly painted. The red robe is crude in colour, and painted in a dry, common-place manner—the black and white pavement produces a very unpleasant effect, being without the gradation that should indicate the perspective of the retiring plane.

AT THE EXETER GRAMMAR SCHOOL.

Artist unknown.

Hugh Crossing. Founder of the School. Twice Mayor of Exeter. Died 1622.

Three-quarter length. Life-size. Oil on canvas.

Standing; full face, slightly to left; grey eyes looking at the spectator; light from the left. The grave, thoughtful countenance wears a somewhat severe aspect, intensified by a closely-cropped grey beard and moustache. The figure is clad in the scarlet, fur-lined robe of office as mayor. Both hands are shown; the left hanging listlessly down, showing a large ring on the little finger; whilst the right holds a pair of buff leather gloves. The neck is encircled by a stiff, thick-plaited cambric ruff, and there are ruffles of similar material and pattern, but of fewer folds, round each wrist. A black cap on head almost conceals the hair. The background is dark, in which no object appears, excepting a mantled shield of arms in the left upper corner. This portrait, formerly in the Council Chamber of the Exeter Guildhall, was presented by the Town Council in 1857. In the upper right corner is "Ætatis suæ 63 : 1621."

AT THE ALBERT MEMORIAL MUSEUM, EXETER.

The works of art, like the other objects of interest collected in this building, are vested in the Mayor, Aldermen, and Burgesses, on behalf of the citizens of Exeter. The collection of paintings and statues will no doubt be greatly extended after the completion of the additional building now in course of erection expressly to receive them. The "Works of Art," properly so called, include the following :

STEPHENS, EDWARD B., A.R.A. *Ante.*

Statue of the late Prince Consort.

Life-size. In Caen freestone.

Executed in 1868 as a gift by the sculptor to the Museum of his native city. The Committee for the reception of the Royal Archæological Society, in 1861, devoted a small balance of money in their hands to defray the bare cost of the stone. The Prince is represented in academic costume; the left leg advanced, and showing the Order of the Garter encircling the knee. The left hand, hanging close beside the figure, holds a college cap; whilst the right is laid on the breast, as if to emphasize speech. The light falls directly from above upon the figure, and causes such shadows below the brow and mouth as to detract from the likeness. The attitude is easy, but fails to recall the habitual bearing of the Prince, which was always influenced by his early military training. The best impression of the statue is obtained from a side view.

Model for a Statue of a "Wrestler preparing for the Grip."

Life-size. In plaster.

Presented to the Museum, in October, 1883, by Earls Devon and Fortescue and the family of Mr. Stephens, as a memorial of the lamented sculptor. On the pedestal is inscribed, "E. B. Stephens, A.R.A., Sc., 1872." The figure displays considerable knowledge and power, although a finer type might perhaps have been selected. The head seems too intellectual for perfect artistic expression of the idea, and the parted lips weaken the impression of concentrated energy and preparation. Subjects of this kind must unfortunately always compete with the matchless representation of athletes, which are among the masterpieces of ancient Greek art.

The Quarrel between the Centaurs and the Lapithæ.

Height, 4 ft. 3½ in.; width, 6 ft. 3 in. Plaster, *alto relievo*.

This model, which obtained the gold medal of the Royal Academy, bears the inscription, "E. B. Stephens, Sc., 1843." It was presented to the Museum, in October, 1883, by the family of

the sculptor. The story represented will be found described in the *Encyclopædia Britannica*, vi. 371, 8th ed. All the figures of the group are in vigorous action, and are of less than life-size. The work is skilfully composed, and elegant in flow of line. The hinder quarter of the horse-form less complete in indication of muscular action than the other parts of the group. The heads are fine, and show much sympathy with the antique.

White Marble Bust from life of the late Richard Somers Gard, Esq., M.P. for Exeter, 1857-65.

Executed in life-size by Mr. Stephens in 1881, and presented to the Museum, in August of that year, by Edward Gard, Esq., brother of the subject. Chiselled with a happy union of vigour and delicacy; the treatment simple and truthful.

BEHNES, WILLIAM. Sculptor. London, about 1790; died there, 1864.

Colossal Statue of Sir William Webb Follett, Knt., Attorney-General, M.P. for Exeter. Died 28th June, 1845, aged 48.

First cast, 7 ft. 6 in. in height, from the original model for the marble statue in Westminster Abbey, presented to the Museum in 1865 by the late Mr. John Follett, of Exeter, brother of Sir William. On the base is cut a copy of the inscription composed by the late Sir Robert Peel, and inscribed on the Westminster Abbey statue.

DURHAM, JOSEPH, A.R.A. London, 1814; died there 27th October, 1877.

Bust of H.M. Queen Victoria.

A life-size cast in plaster, executed by the sculptor from his marble bust, and bearing the inscription, "J. Durham, fecit, Osborne, 1855." It was given by him to the late F. W. L. Ross, Esq., of Topsham, and presented to the Museum in October, 1882, by Henry Greatwood, Esq., the heir of Mr. Ross. The bust represents Her Majesty soon after she ascended the throne. A simple coronet, interwoven with rosebuds, gives dignity to the head; a pleasing though rather weak rendering of a difficult subject, the queenly look of the august theme being quite merged in the womanly.

Marble Bust of F. W. L. Ross, Esq., of Broadway House, Topsham, who died on Christmas-day, 1860.

This bust, of more than life-size, was executed from life by Mr. Durham in 1850; and was presented to the Museum, in 1865, by the widow and executors (of whom the sculptor was one) of the late Mr. Ross. Mr. Durham had been befriended in early life by Mr. Ross, and erected to his memory the marble tomb which forms the principal monumental structure in Topsham Cemetery. The bust

is excellent in modelling and arrangement; but the chiselling has been so tamed by finish and the file, as to suggest moulding in wax rather than cutting in marble.

PIERONI, S. C., of Bath.

Bust of Captain John Hanning Speke. 1827-64.

An obituary notice of this distinguished explorer and discoverer of the Victoria Nyanza, the source of the Nile, will be found in the *Illustrated London News* for 24th September, 1864, p. 322. He was born in this county in May, 1827, and was accidentally shot at Box, in Wiltshire, 15th September, 1864. The bust was presented to the Museum by the Rev. A. H. Hamilton. It has not sufficient artistic merit to constitute it a worthy rendering of the fine and expressive head of the enterprising traveller.

WILLIAMS, J. EDGAR.

Charles John Follett, Esq., B.C.L. Twice Mayor of Exeter,
1873-4.

Full length. Life-size. Oil on canvas.

This portrait, executed in 1875, and placed by the Town Council in the Museum in the following year, was presented by a body of subscribers in recognition of Mr. Follett's services as mayor. It is signed and dated by the artist. It is an excellent example of his powers, and a work of much merit. The subject, aged about 40, is represented standing in mayoralty robes of scarlet cloth, edged with sable fur, and with badge and chain of office. Nearly full face, slightly to right, the eyes looking at the spectator. Light from right. The left hand rests on an open document placed on a table on right, and covered with drab cloth, with dark flowered pattern; the right hand rests on the hip; an inkstand on the table; an arm-chair behind the figure to left. In the background a picture, hanging on the wall, introduces a view of the Exeter Guildhall, and some timber-framed, gable-fronted houses of a past age.

CROSS, JOHN. Tiverton, 1819. Died 1861.

The Burial of the two sons of Edward IV. in the Tower of London, 1483.

Height, 9ft. 6in.; width, 11ft. 1in. Life-size. Oil on canvas.

Presented to the Museum in 1868 after purchase by a subscription amongst the artist's Exeter friends, and has been engraved in the *Art Journal*. It is signed, "John Cross, London, 1850." This fine and important picture conveys a high idea of the ability and attainment of the painter, and awakens renewed feelings of regret that death should have so soon terminated his career. The conception is simple and dignified, the composition effective, and the story is clearly told. Exception may be taken to the too evident

artificiality of the lighting, by which attention is not led but forced to the chief group. The small window above is awkwardly placed just in the centre of the background, and does not assist the scheme in any way. The hands are especially well drawn and expressive. The general colouring is sober but harmonious; but might have been advantageously somewhat more distributed into parts not immediately about the chief group. The general result, however, is an excellent work, which does honour to the English school.

POUSSIN, NICOLAS (?). Native of Andeley, in Normandy, 1594. Rome, 1660. LE BRUN, CHARLES (?). Paris, 1619-1690.

The Meeting of Venus with Æneus and Achates on an unknown shore.

5 ft. 4½ in. × 7 ft. ½ in. Less than life-size. Oil on canvas.

This unsigned painting, stated to have been purchased in France by Lord Strathnairn for £1000, was presented to the city of Exeter, in 1880, by the late Richard Lewis, Esq., a barrister of the Western Circuit, and well known as Secretary to the National Lifeboat Association. The subject is the meeting thus described in Dryden's translation from Virgil—

"Armed with two pointed darts he leaves his friends,
And true Achates on his steps attends.
Lo! in the deep recesses of the wood
Before his eyes his goddess mother stood,
A huntress in her habit and her mien."

This picture displays such high qualities in firmness of drawing, masterly handling, and purity of tone that it is difficult to believe that it is anything but an original work. No picture of this subject is, however, mentioned in Miss Graham's catalogue of Poussin's paintings, and some characteristics of the style and colouring favour the supposition, that it may be an early work of Le Brun, who was intimate with, and at first much influenced by, N. Poussin.

OPIE, JOHN (?). *Ante.*

The Death of Virginia. Cincinnatus stabbing his Daughter at Rome.

5 ft. 11½ in. × 6 ft. 11½ in. Oil on canvas.

This picture, presented to the Museum, in 1865, by the late John Gendall, is stated to have been painted by Opie for the Graves, of Islam Hall, near Manchester, at a cost of 300 guineas. It is not, however, mentioned by Mr. J. J. Rogers in his book on *Opie and his Works*. Has suffered much from neglect, and the darkening of the varnish, but, as far as a judgment can be formed, it does not appear to be painted with the rude solidity which distinguished Opie's work, even at an early period. Is more in the style of Haydon, whose passion for classic subjects was so marked from the beginning of his career.

DAVID, JACQUES LOUIS. 1748-1825. Named his first painter by Napoleon I.

Head of the Emperor Napoleon I.

Diameter, 1 ft. 6½ in. Circular. Oil on canvas.

The following inscription on the back of this portrait relates its history: "This likeness of Buonaparte was painted at his request by the famous French artist, David, and was sent by Buonaparte, when he was consul, to his sister, Madame Murat, when she was queen of Naples. On the death of Murat, who was shot by his subjects, she quitted Naples, leaving this portrait as a present to a lady, one of the Neapolitan *noblesse*, whom the king of Naples used to visit. He having expressed his displeasure at seeing the portrait in her possession, induced her to sell it, and it was bought by me (signed) Frank Turner, of Exeter. I bought it at the palace of the noble lady. Some lady friends of mine and Mrs. Turner's having hired some of the apartments of the palace, she had committed the sale of it to them, and it was there I bought it. I was offered 150 guineas for this picture by a dealer in pictures, who had a collection of paintings at Curtis's large room." After descending to the late Rev. Fisher Turner, it became the property of the late Mr. James C. Wilcocks, of Duryard, who presented it to the Museum in 1869. The head of Napoleon, about five inches in height, occupies the centre of a wreath of myrtle (?), and is relieved against the focus, of which the rays form the whole background of the painting. An interesting portrait which, though so small, is quite in David's manner.

After BEECHEY, SIR WILLIAM, R.A. 1753-1839.

Admiral The Rt. Hon. Edward Pellew, G.C.B. First Viscount Exmouth. 1757-1833.

Three-quarter length. Life-size. Oil on canvas.

This copy of Beechey's portrait was bequeathed to the Museum by the third Viscount Exmouth in 1870. The light falls from the left on the three-quarter face turned, as are the eyes, to right. The gallant admiral, in full naval uniform, wears his orders on his breast. The left hand, holding a spy-glass, rests on a capstan (to right), covered by a flag; the right hand rests on the hip. The dark background is plain, save that in the lower corner (to left) is shown a British man-of-war engaging an enemy. An excellent copy, but has suffered by cleaning, which has removed some of the glazing so as to produce crudeness.

Artist unknown.

William Warmond. Burgomaster of Leyden.

Half length. Life-size. Oil on panel.

This portrait, purchased in Paris by the late Dr. Lefevre on its own merits, was presented to the Museum in July, 1872, by his

widow, Mrs. H. Belfield Lefevre. On it is inscribed in upper left corner: "Ætatis suæ 66, A° 1607." It formerly had attached to the back an inscription, showing that its subject married Anna, daughter of — Von Heussen, and niece of his spouse, Anna Adriana Pears, of Landharft. The light from left falls on a ruddy sun-burnt countenance turned three-quarter face to right; the short hair is turning grey, as are the beard and moustache; the whiskerless face is set in a ruff collar; the figure in a black gown. The left hand grasps a glove, whilst the right is laid on a skull placed on a table to left. The little light in the plain dark background is chiefly concentrated behind the head. A mantled shield in upper right corner bears *arg. a lion rampant gules*. A really fine picture, perfectly well preserved, and evidently by a master hand. It is a valuable possession, and would be an ornament to any gallery. The distinctive characteristics of this picture suggest that it may be the work of Frank Hals, born at Mechlin 1584, died 1666.

Artist unknown.

Thomas Furlong and his wife. Exeter.

Half length. Life-size. Oil on canvas.

These two portraits of natives of Exeter were presented to the Museum by Mr. F. H. Phillips, of Ashley Villa, Park Street, Taunton. The husband, a man apparently about 50, wears a costume of the latter part of the eighteenth century of blue official coat, with gilt buttons; the eyes regard the spectator from a face three-quarter to right; the light is from the left. The plain light-powdered wig shows against a dark background. The lady, perhaps five years younger, turns three-quarter face to left, with eyes in the same direction. She is in evening costume, with quilted satin stomacher and powdered hair brushed upwards in a pile, as was the fashion of the day. The portrait of the lady is much superior to that of the husband, which does not seem to be by the same hand. They are certainly not by Hudson, whose name appears on the labels.

CLACK, RICHARD AUGUSTUS, son of the rector of Moreton-hampstead. Died 1880.

Sir Joshua Reynolds, P.R.A.

Half length. Life-size. Oil on canvas.

This copy of one of Sir Joshua's portraits of himself was presented to the Museum by the artist in 1869.

Thomas Gray, of Exeter. "The Railway Projector."

Born at Leeds, 1788; died at Exeter, 1848.

1 ft. 2½ in. × 11 in. Less than life-size. Oil on canvas.

Painted by Mr. Clack in 1848, and exhibited at the National Portrait Exhibition in 1868. Having been bequeathed to the Museum by the artist, it was received from his niece, Miss M. A.

Clack, in January, 1881. The head and figure are turned three-quarters to right; the light from left. The figure is seated, with table in front, the forefinger pointing to a diagram in a book to which Mr. Gray is directing the attention of the spectator. A clever little picture, treated with artistic feeling and much technical skill.

ABBOTT, JOHN WHITE. *Ante.*

The High Street, Exeter, in the year 1797.

10½ in. × 12½ in. Oil on canvas.

Presented to the Museum, 4th July, 1883, by the Misses Abbott, of Exmouth. Represents the High Street, from the Guildhall to Goldsmith Street, when its surface was paved with round pebbles, and there were no side footpaths. This small picture has excellent technical qualities, and is highly interesting, awakening regret that artists of such ability were led by the taste of their day to give so much time to the production of imaginary landscapes instead of perpetuating, with the fidelity of this example, actual scenes, the records of which acquire, with the progress of time, ever-increasing value.

WILLIAMS, WILLIAM. Formerly of Plymouth, now of Topsham.

Landscape—Whiddon Park, on the Teign.

Diameter 23½ in., in square frame. Circular. Oil on canvas.

Presented to the Museum, in 1868, by the Committee of the Exeter Art Union.

HART, THOMAS, of Falmouth.

Kynance Cove, Cornwall, painted 1868.

14 in. by 24½ in. Water colour.

A signed and dated painting.

WHITAKER, GEORGE. Exeter, 1834; Dartmouth, 1874.

Seascape—The Morning Watch.

15½ in. by 27 in. Water colour.

Presented to the Museum, in 1868, by the Committee of the Exeter Art Union.

Besides the foregoing, the Albert Memorial Museum collection includes several works of minor interest and value, amongst which may be named the following:

Copy of half-length portrait of *John Milton*, æt. 63, 1671. Presented, in 1868, by the late Major-General Studd, of Oxton House, near Exeter.

Ship on Fire. Oil on canvas. 27½ by 34½.

Also *Shipwrecked Sailors.* Oil on canvas. Presented, in 1869, by the late Mr. J. C. Wilcocks.

Harry Purchas, alias Squintem. An eccentric character, of Exeter, and candidate at the mock election for Ide. Painted by J. Bird, of Exeter, and presented by Mr. John Algar in 1870.

Four sketches in oil of *Australian, Papuan, Malay, and Patagonian Natives*, by Augustus Earle, artist to H.M.S. *Beagle*, in the voyage round the world in 1832. From the collection of the late Mr. F. W. L. Ross. From the same collection, *The Dodo*, painted from a woodcut by F. Hart, of Exeter.

IN THE ASSIZE COURT, CASTLE OF EXETER.

BROCKEDON, WILLIAM. Totnes, 1787; London, 1854.

The Acquittal of Susannah.

18 ft. 6 in. by 15 ft. 6 in. Oil on canvas.

This large historical picture was painted when the artist was about 21 years of age. A tablet on the upper part of the frame bears the words, "Painted and presented to the county of Devon by W. Brockedon, of Totnes, and placed here in the Shrievalty of Sir W. T. Pole, Bart., 1818." The composition, which includes twenty-four figures, is of the pyramidal order, the apex being formed by the figure of Daniel standing erect near the centre of the picture, his left hand uplifted as he pronounces the innocence of the accused. With his right hand he repels the accusing elders, who are dragged away on the left by officers of the court. On the right is Susannah, in pseudo-Eastern dress of white drapery, typical of innocence, covering the head and falling over a blue robe; she raises her eyes to heaven, as her husband clasps her in his arms. Before this group kneels a female figure, restraining a nude child, who runs with outstretched hand towards Susannah. Behind, on the right and left, are figures of officials, spectators, guards, and others. In the background Assyrian architecture, indicating that the scene occurs in the portico of a basilica, or court of justice. The age of the painter at the time of its production being remembered, the merits of this ambitious picture must excite more surprise than its obvious defects. With the enthusiasm of youth, the artist was not deterred from the attempt to realize the subject which had fired his imagination, by a due sense of the limitation of his own powers and attainments. The picture lacks dignity. The countenances are more British than Oriental; the head of Daniel is evidently painted from a female; the anatomy of the almost nude figure to the left is imperfectly expressed; the forms display bulk in place of muscularity. The arrangement of colour is ineffective; especially awkward is the repetition in equal quantity of strong red in the drapery to the right which contends with the red at the centre of the picture. The story is, however, not obscurely told. The heads are firmly modelled, and the lines of the composition interwoven with some success. The draperies are fairly well cast, and the general effect is not marred by any glaring error or deficiency. [This picture has been cleaned since this Report was presented.]

IN THE COLLEGE HALL OF THE VICARS CHORAL, SOUTH STREET, EXETER.

On the oak-panelled walls of this ancient hall are the following five half-length portraits, all in oil on canvas. With one exception, all have plain dark backgrounds, and all are life-size, in appropriate oaken frames :

William Buller, Dean and afterwards Bishop of Exeter.
Consecrated 1792. Died 1796, aged 61.

The figure and face are slightly but equally inclined towards the right, the eyes regarding the spectator ; the light from left. The bishop, arrayed in lawn surplice and black stole, wears a bushy light wig falling to the shoulders. This portrait is placed over the centre of the fine heraldic mantelpiece. It has no exceptional qualities calling for detailed notice, and much resembles the portraits belonging to the Corporation of the Poor. Another portrait of this dignitary is described in a subsequent part of this Report.

SHARLAND, W. *Ante.* After GANDY, JAMES.
Tobias Langdon, Priest-Vicar.

Nearly full face, slightly turned to left ; light from right ; costumed in black gown and bands, with heavy dark wig descending on the shoulders. The right hand, raised, holds a roll of white paper. An engraving in mezzotint, measuring 12 in. by 9½ in., was made from the original portrait by J. Faber in . The strange history of the original by Gandy is thus narrated by Mr. Pycroft in his *Art in Devonshire*, p. 47 : " This painting is, alas ! no longer to be found. In its place hangs an admirable copy by the very clever Exeter artist, Sharland ; but where the original is gone no one at the present time knows. The picture was long ago entrusted to a varnisher, cleaner, and restorer of paintings, who kept it so long on his hands that its owners were tired of asking for it. He then caused a copy to be made, and this he sent to the Vicars' Hall, and sold the original to a Mr. Kendall, an Exeter lawyer and picture collector. Kendall met his death by drowning [in 1832], and when his goods were sold the portrait passed into the hands of a Mr. Birt, a picture dealer, who had a shop near the old Grammar School [at East Gate], and he sold it to the late Charles Brutton [solicitor], of Exeter. At his death it was sold, and up to the present time has not been traced. When in the hands of the Vicars Choral it was an oval, but the fraudulent restorer altered it to a square, or rather the copy to a square, to match other paintings in the hall." This copy is the most striking

and meritorious picture of the series, and has marks of fidelity to the original which support the tradition that the portrait was one of James Gandy's most successful productions, and an excellent work of art.

Artist and subject unknown.

This portrait represents a man of about 35 years; nearly full face, turned slightly to right, the figure being rather more in the same direction; in dark costume, with a dark brown bushy wig falling on the shoulders, and concealing all but the front part of a limp white linen collar, with silken tassels dependant. The right hand, raised to the level of the waist, holds (on right) a paper or book. Above this, in the background, a strong light falls on the base of a column partially revealed by the withdrawal of a dark curtain. This portrait, which appears to belong to the latter part of the 17th century, is a work of little artistic merit.

Artist and subject unknown.

A priest-vicar in black gown and bands, apparently aged from 30 to 35; the hair of the dark full wig is parted in the centre; the light from the right, but nearly direct; the face, nearly full, is, like the figure, turned slightly to the left. This work, which apparently dates from the early part of the 18th century, is of inferior quality.

MOGFORD, THOMAS. *Ante.*

*Philip Salter, Lay Vicar and Musical Composer.
Born at Honiton's Clist; died about 1834.*

Three-quarter face, slightly to right; the figure still more in that direction; the eyes regard the spectator; light from left; dark ordinary dress, with white cravat and standing collar; own dark hair and short whiskers; a favourable specimen of the artist's attainments in portraiture; finely drawn; the colouring fresh and natural; the features expressive; and the technical methods sound.

Besides the foregoing portraits, seven of the eight panels in front of the gallery of the hall contain the mediæval figures of bishops who were benefactors of the College; viz., Leofricus, 1049; Marshall, 1191; Lacie, 1420; Brentingham, 1370; Staforde, 1395; Foxe, 1492; and Oldham, 1519. These form a very interesting series, and if not originals, are faithful copies in style and method of early 16th century paintings. The names, as above, are painted in modern characters under the portraits, but the authority for them is unknown.

ON NORTHERNHAY, EXETER.

STEPHENS, EDWARD BOWRING, A.R.A. *Ante.**The Deerstalker.*

This life-size statue in bronze is placed, amid surroundings of green foliage, at the entrance to the chief public walk of the lamented artist's native city. It was purchased and presented by his friends and admirers, and was unveiled, with appropriate ceremony, in Bedford Circus, in 1878, but was removed, in 1880, to its present more suitable position. The most completely representative example of the able sculptor's imaginative work which the city possesses. The composition is skilful; the action expressive, and free from exaggeration.

Sir Thomas Dyke Acland, Bart., formerly M.P. for the County. Born 1787. Died 1871.

White marble statue, on granite pedestal. This memorial of the sculptor's early friend and patron was completed and erected, in 1861, under the circumstances narrated in Mr. Pycroft's *Art in Devonshire*, p. 135. One of those quiet, truthful portrait statues which the sculptor treated with such recognized success.

John Dinham, Philanthropist of Exeter. Born at Kenton, 1788; died at Dawlish, 1864.

A white marble seated figure, executed in 1865, and erected in the following year "by the citizens of Exeter and others, in memory of his piety, integrity, and charity." Like the statue of Sir Thomas Acland, this is a work of evident merit, both as a likeness and for skilful management of the unpicturesque modern dress. Both are happily placed, and do not excite the feeling—as statues of these proportions often do when placed in the open air—that they are not of sufficient size to be impressive.

IN THE CASTLE YARD, EXETER.

STEPHENS, E. B., A.R.A. *Ante.*

Hugh, Earl Fortescue, K.G. Born 1783. Died 1861.

A colossal white marble statue. The pose dignified; the figure and drapery rendered with much ability. The deep cutting of the pupils imparts a rather wild look to the eyes; an effect which is heightened by the sharply-modelled and overhanging brows, in some degree detracting from the fidelity of the portraiture by imparting a look of sternness foreign to the disposition of the distinguished subject.

IN BEDFORD CIRCUS, EXETER.

STEPHENS, E. B., A.R.A. *Ante.**William Reginald, the present Earl of Devon. Born 1807.*

A bronze statue, on granite pedestal, erected in 1880 on the spot previously occupied by "The Deerstalker," already described. The simple fidelity and refinement of this work are at once recognized; but its effect is prejudiced by the stunted proportions and commonplace design of the pedestal. The gloomy colour of the bronze supports the often-made remark, that for portrait statues metal has nothing to recommend it but its permanence. For monumental groups, where sombre grandeur and general effect are more looked for than individual likeness, its value is conceded by the best judges.

AT A HOUSE IN THE CLOSE, EXETER.

THE RESIDENCE OF MISS GEARE, FORMERLY OF THE MISSES GULLETT.

OPIE, JOHN, R.A. *Ante.*

Three family groups; viz.:

No. 1. *Christopher Gullett, of Collins, near Tavistock, Deputy Clerk of the Peace for Devon; his wife Anne; and their youngest child, Georgiana.*

No. 2. *Mary, Charlotte (afterwards Mrs. John Geare), Caroline, and Eliza Gullett, four younger daughters of the above.*

No. 3. *Anns (eldest daughter) Christopher, and John, sons of the above.*

Three-quarter length. Life-size. All 51 in. × 40 in. Oil on canvas.

These charming family groups were painted about the year 1790, during a stay of six weeks spent by Opie at Collins. They are mentioned in Mr. John Jope Rogers's life of the artist.

No. 1. The parents are represented seated, the child standing between them. Mr. Gullett on the left, three-quarter face to right, the eyes still more to right. The light from left. Dressed in brown olive-green coat, with plain round metal buttons, and wearing a bob wig powdered, and with two curls at the side. The right hand only is visible, resting on a table on which two books are placed.

Mrs. Gullett, who wears under a cap her own luxuriant brown hair, is dressed in a stiff-bodied white satin gown; the neck, otherwise bare, is encircled by a narrow black velvet band, the bust covered with muslin; the face three-quarters to left, the eyes inclined yet more in the same direction; the right hand rests on the child's shoulder, and holds its "leading-string," whilst the left, resting on the lap, caresses its hands. The short sleeve of the left arm ends at the elbow in a small lace ruffle.

The child, almost full face, turned slightly to right, wears a

dress of the same white hue as her mother's; the background of the picture is plain and dark.

No. 2. In his volume on *Opie and his Works*, Mr. J. J. Rogers well describes this picture as "a beautiful group of four girls, aged from four to twelve, in various attitudes." On the left is Mary, the eldest (who died unmarried in 1833), seated on a very low foot-stool, in gown of dark purple-grey, with a yellow sash round the waist, and wearing on her head an elaborate muslin cap decked with feathers. Three-quarter face to right, the eyes looking at the spectator. Charlotte, the next in age, is kneeling on the right of the picture, nearly full face to left, wearing an outer dress of muslin over primrose silk, with a white sash round the waist. Her cap is of plainer form than that of her elder sister.

The two younger children occupy the centre, dressed in plain white muslin; Caroline in blue sash behind Eliza in one of reddish hue. In all four the hair is dark, and dressed across the forehead. The light is from the left, but almost direct; the background, which is very dark in the centre, has on the left the corner of a pedestal and base of pillar; on the right, a dark red curtain.

No. 3. In this group, Anne, the eldest daughter of the family, about fifteen years of age, is on the left, seated before a spinnet, and wearing a very low white muslin dress with satin sash of greyish green, a muslin cap trimmed with frills, feathers, and light blue satin bows. Both hands are partly seen engaged on the keys of the spinnet; the face is three-quarters to right, the eyes looking in the same direction.

Christopher, a youth of sixteen, stands at the rear in the centre, holding in the left hand a flute of light wood ringed with ivory; the face is in full, the eyes regarding the spectator; costume a red coat with small metal buttons, the white cravat being tied with a loose bow; own hair powdered and tied at the back.

John, aged twelve (who afterwards became a barrister, and died at Frankfort Street, Plymouth, in 1825), is on the right, wearing a grey coat with ornamental silver buttons, over a buff waistcoat; the folds of the continuous frilled shirt front and collar fall over the collar of the coat; part of the left hand is shown holding a roll of music; the face is three-quarters to left, the eyes looking out of the picture to left, but nearly at the spectator; all the figures are shown at three-quarter length. The dark background shows a fluted column at upper right corner.

This remarkable series of portrait-groups affords such a representation of a well-to-do English family, at the close of the last century, as can scarcely be viewed without unusual sentiments of interest and sympathy. The burly frame and blunt features of the father recall the lines:

"An honest man, close buttoned to the chin,
Broadcloth without, and a warm heart within."

The mother, erect in matronly and justified pride, though not looking at, yet tenderly clasps the "wee toddlin' thing" at her knee, whilst from her right hand hangs a looped band, doubtless the familiar, though now seldom seen "leading-strings," indicating a more tender age (two years) than the child's appearance would suggest. The little creature's face is one broad smile of joyous confidence.

The pictures are in Opie's best manner, painted after eight years of practice in London, and display his great qualities, with something of his deficiencies, consciousness of which often made him exclaim, "I shall never, never be an artist!" Drawing, colours, and arrangement are excellent. The handling and general treatment are direct, vigorous, and simple; in parts, it must be allowed, approaching rudeness. The chief defect is evidence in the parents (though less in the elder children) of consciousness that they are sitting for their portraits, and an absence of inter-connection of looks and gestures.

The most attractive picture, though all are admirable, is No. 2. The deprecatory look and action of the little girl, as she yields her sampler to her elder sister, are full of truth and charm. The eldest girl looks up from the doll's cap upon which she is engaged with sweet ingenuous gravity; the youngest nestles, reclining by her, in happy grace and simplicity. It must be admitted that the relative positions of the two children to the right are not in accordance with their action. Stationed and engaged as they are, a more profile view of the face must necessarily have been presented by the girl kneeling in the foremost plane of the picture, and her back would have been almost fully turned to the spectator. This is a very common error when figures are successively placed on the canvas, drawn singly, and not from an actual assemblage of the living personages.

The refined beauty of the boy in the third picture is very striking, and rendered with an entire absence of affectation or self-consciousness, such as too often repels in representations of youth even by artists of high attainments. It is fortunate that such subjects as this band of engaging children employed the pencil of the gifted Cornish artist, and remain to testify how great his abilities were.

These pictures are history, immeasurably more valuable than his huge canvasses covered with so-called Scriptural or historical subjects, from which every element of truth is absent.

Artist unknown.

Portrait of George Hakewill, D.D. One of Prince's Worthies. Born in Exeter, 1579. Died at Heanton, Devon, 1649.

Half length. Rather less than life. Oil on canvas.

This portrait, the property of Mr. W. Cotton, F.S.A., of Exeter, represents the learned Archdeacon of Surrey at a much younger period of life than the one placed in honour of his memory in Exeter College, Oxford, and known by an engraving, published by Harding, of Pall Mall, in 1796. Even if there were any doubt about the similarity of the features, the portrait may be identified as that of Dr. Hakewill by the coat of arms in the upper corner to left; viz., *Or, a bend gules, six trefoils slipped purpure*. He is represented seated in a red leather arm-chair, studded with brass nails, with full face, and eyes looking straight from the canvas; the light from left; apparent age, from 45 to 50. Clad in black academical gown, with ruff round the neck; plain white cuffs. Leaning on a table, on which are inkstand and sand-box, and an open watch. Both hands are shown; the right being employed in writing in a book with a short quill pen. Plain dark background. The portrait is in the hard, stiff manner of the period, but with more than average character.

IN THE GUILDHALL, BARNSTAPLE.

HUDSON, THOMAS. *Ante*. Assisted probably by Vanhaaken, and Hudson's pupils.

Portraits of thirty Barnstaple worthies; viz.:

Henry Beavis, Esq., mayor; Mr. George Wickey, mayor elect; Richard Mervyn, Esq., Deputy Recorder, born at Heanton, 1672, died 1740; Robert Incledon, Esq.; Mr. Richard Newell, Rev. James Steed, Mr. Thomas Harris, Mr. Paul Tucker, Mr. John Frayne, Mr. Roger Chapple, Mr. Charles Wright, Mr. Marshall Swayne, William Lantrow, Esq., Mr. John Swayne, Rev. Robert Luck, master of the Grammar School, Mr. Charles Velly, Mr. George Gayton, Mr. Samuel Berry, Mr. Richard Knight, Mr. Alexander Webber, Mr. Matthew Rock, Mr. John Baker, Mr. Robert King, Mr. Mark Slee, Mr. Charles Marshall, Mr. Nicholas Glass, Mr. George Score, Mr. H. Wickey, Mr. H. Drake, Mr. Gregory Anthony.

All half length. Life-size. Oil on canvas.

With the above list there exists amongst the borough papers a statement that the portraits of these members of the corporate body and borough officials were presented to the Corporation in 1738, to adorn their hall, by Sir John Chichester and Theophilus Fortescue, Esq., the representatives of the borough in Parliament; but there is also a resolution amongst the records, dated 10th June,

1740: "That the thanks of this Corporation be given to Henry Rolle, Esq., our Recorder, for his present of the pictures of the Corporation; and also desire the said Mr. Rolle that he will be pleased to sit for his picture at the expense of the Corporation, and that Mr. Mayor do the same."

Hudson is traditionally said to have been assisted in the draperies, &c., by his pupil, Sir Joshua Reynolds; but although Lysons and local historians generally have accepted the story, it cannot be reconciled with the fact that Reynolds was first sent to Hudson's studio in 1740.

The names of the different persons represented (as given in the list) have apparently at some later period been painted *on* the pictures (right hand corner), as a number is also painted on each, with a reference to where it was hung. Although no doubt notabilities of the period, they are, with a few exceptions, not of sufficient importance for biographical notice. Very few of the names now remain or are even represented in the neighbourhood, though many of them survive in connection with the public charities, or are known by their monumental memorials.

The Incedon family have not quite died out, and Robert Incedon, one of the most marked and portly of the portraits, was in his day noted as a lawyer, a scholar, and an antiquary.

Richard Mervyn, the Recorder, was also of some eminence. He was the elder son and heir of the Rev. William Mervyn, rector of Heanton Punchardon, who purchased the Marwood Hill Estate.

Matthew Rock was one of the band of Huguenots, who escaped from France and settled at Barnstaple after the revocation of the Edict of Nantes.

The Rev. Robert Luck, who was Master of the Grammar School, was noted as a poet of no mean rank. He published a volume of poems in 1736. John Gay was a pupil of his for some years, and in one of Luck's poems, addressed to the Duke of Queensberry, occur the following lines:

O Queensberry, could happy Gay
This offering to thee bring!
"T is his, my Lord," he'd smiling say,
"Who taught your Gay to sing."

As works of art there is not much to be said of these portraits. Taken generally there is a tame uniformity, which reminds one of club-portraits; indeed they were much of that character, probably mostly painted from the lay figure; they are all uniform in size and treatment; some full face, the others slightly inclined right or left; the eyes in all cases full on you; the hands not shown; all are close shaven; thirteen are robed in the mayor's gown, red and sables; the others in the usual corporator's robe, black and velvets, nearly hiding the rest of the costume, of which only the coat, with standing collar, and voluminous white neck-cloth appear, and as well as the wigs, which all wear, are almost identical in the

whole series. The recorder is in full legal robes, and the clergymen enveloped in their cassocks and bands. The background of all has the same uniformity, a brown tint, and no accessories. In fact the faces are the only distinguishing characteristics. These are all distinct and well marked, and no doubt painted from life, and are traditionally reputed to have been good likenesses; all the rest is conventional, and may well have been filled in by a mere pupil.

All these pictures are in a very decayed state from damp and neglect. An attempt to clean or restore them was made a few years ago; but it was found that nothing could be done without relining the whole, and they were accordingly only washed and slightly oiled, as they were too much decayed to be varnished.

HUDSON, THOMAS (?). *Ante.*

The Rev. Samuel Thompson, vicar of Barnstaple. Died 1734.

Half length. Life-size. Oil on canvas.

This portrait, which is in better condition than its companions, was presented to the Corporation after Mr. Thompson's death by his relatives. He was eminent as a preacher and philanthropist.

WRIGHT, JOSEPH, A.R.A. (?). Derby, 1734-97. After JANSEN CORNELIUS.

John Penrose, an opulent merchant, and founder of almshouses. Died 1624.

Oval. Half length. Life-size. Oil on canvas.

The original of this portrait, attributed to Cornelius Jansen, hangs in the Penrose Almshouse Chapel at Barnstaple. It was painted in oil on canvas; but having become considerably injured by age and damp, was some years since cleaned and restored in a fashion by being transferred to a panel measuring 18 in. by 24 in., the frayed edges having been trimmed. It is suggested that the Guildhall copy was made by Joseph Wright about the year 1780, as he was then at Barnstaple, and painted a number of portraits for the Roberts family. Mr. Roberts gave this one to the Corporation about half a century ago. It is in very good condition, but, like those in the Guildhall, it bears no name or mark of the artist. It is worthy of attention, illustrating the mercantile importance of the port in the 16th and 17th centuries. Penrose wears under a red gown a close-fitting black coat, with ruff of the period, and has a slight red beard.

Gilbert Paige (?). Mayor in 1629-41.

This picture, the painter of which is unknown, and the subject uncertain, hangs in the hall of the Penrose Almshouse. It is of the same character as the Guildhall portraits.

Besides these portraits there are others in public buildings at Barnstaple, of which the Committee hope to present fuller particulars

in a future Report. Amongst them may be named portraits of themselves presented by the first and second Earls Fortescue to the North Devon Infirmary, and hanging in the boardroom of that institution. The library of the Literary Institution contains two portraits of its benefactor and patron, W. F. Rock, Esq. ; one painted in his 35th and the other in his 70th year. Also portraits of the second and third Earls Fortescue, and of Mr. J. R. Chanter, the first honorary secretary and originator of the institution. These are by J. Edgar Williams.

AT TAVISTOCK AND PLYMOUTH.

BOEHM, JOSEPH EDGAR, A.R.A. Native of Germany. Settled in London.

Statues of Sir Francis Drake.

In September, 1883, the Portreeve of Tavistock unveiled, at Fitzford, near that town, a bronze statue of Sir Francis Drake, presented to Tavistock by his Grace the Duke of Bedford, K.G., and executed by Mr. Boehm. It is a very noble work of art, and one of the finest sculptural character-studies of the present century, albeit the likeness is so far idealised that it resembles closely no one accepted portrait of the great sailor, though the features of several portraits are recalled. The portraits of Drake, however, which are regarded as authentic differ so widely among themselves, that it is impossible to choose between them with any approach to general acceptation ; and the sculptor must therefore be considered to have exercised a wise discretion.

The figure is heroic in size, and the attitude bluff and bold, but dignified. The left foot is advanced, and the left hand rests upon the hip, just above the hilt of the sword ; the right hand holds a pair of compasses towards a terrestrial globe. The face has a full beard, and the moustache twisted points. The head is turned towards the left ; and the eyes look upward and outward, as if bent, sailor fashion, upon some object in the far distance. The attire is the rich picturesque garb of an Elizabethan gentleman, but with no distinctive characteristic of the sea, or of the profession of arms beyond the sash over the right shoulder.

The general expression of the countenance is that of watchful wariness ; and the whole pose of the body is what may be called an expectant rest, ready at any moment to break forth into vigorous action—recalling the pause of the eagle ere he makes his swoop, or the quiescence of the bull-dog the moment before he pins his adversary in his merciless grip.

The statue is raised on a pedestal of granite, and looks towards the spot at Crowndale where stood the house in which Drake was born. In panels on three sides of the pedestal are masterly *bas reliefs*, by Mr. Boehm, representing respectively Elizabeth knighting Drake after his voyage of circumnavigation on board his ship at

Deptford; the legendary game of bowls on Plymouth Hoe, which Drake is said to have insisted on playing out when news came of the approach of the Armada—"There's time enough to play the game out first, and thrash the Spaniards after;" and the burial of the dead hero at sea.

The inscription is: "Sir Francis Drake, one of ye first who in his voyages put a girdle round the world."

By the permission of the Duke of Bedford the Drake Memorial Committee, founded at Plymouth in 1880, was enabled to obtain a replica of the Tavistock statue from Mr. Boehm, and this was unveiled on Plymouth Hoe by Lady Drake, of Nutwell Court, in February of the present year. The site for the statue here, as at Tavistock, was selected by the sculptor himself. The *bas reliefs* are not repeated; and the die of the pedestal is a single polished block of red Scotch granite. Drake is looking seaward, but up Channel instead of down, which might have been regarded as more appropriate to the Armada reminiscences of the locality.

AT PLYMOUTH GUILDHALL.

Two paintings of note have been placed in the Plymouth Guildhall Buildings—the one the well-known *Deliverance of St. Peter*, by Hilton, purchased and presented to the town by a committee of gentlemen; and the other Haydon's still more familiar *Raising of Lazarus*, lent by the Trustees of the National Gallery, under the recently passed Loan of Works of Art Act of that institution. The acquisition of the latter picture is the more valuable, as it is the only example of the artist open to the public view in his native town and county.

AT THE PLYMOUTH INSTITUTION.

Two paintings, by J. M. W. Turner, R.A., lent by the Trustees of the National Gallery, now hang in the Plymouth Institution—a very early work, "The Harvest Home;" and a late one (1850), "Mercury sent to admonish Æneas."

AT 9, ATHENÆUM TERRACE, PLYMOUTH.

THE RESIDENCE OF FRANCIS FOX, ESQ., SURGEON.

EASTLAKE, SIR CHARLES LOCK, R.A. Plymouth, 1793; died at Pisa, 1865.

James Fox, Esq., of Plymouth (grandfather of the present owner). Born 1741; died 1819.

Half length. Life-size. Oil on canvas.

This and the one next described are two of the many portraits of his fellow-townsmen painted by this distinguished Devonian

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artist at about the same time as his well-known full-length likeness of the Emperor Napoleon I., on board the *Bellerophon* in Plymouth Sound, in 1815. They are included in the list given by Lady Eastlake in her *Memoir*, published in 1870. The massive head and features of Mr. Fox are represented nearly in full, the face turned slightly to the left. He wears his own long grey hair, curling at the neck, and is habited in plain drab-coloured Quaker dress. The light falls on the figure from the right. Plain dark background.

IN BANK STREET, PLYMOUTH.

THE RESIDENCE OF ALFRED HINGSTON, ESQ.

EASTLAKE, SIR CHARLES LOCK. *Ante*.

Joseph Hingston, Esq., Banker, Plymouth (father of the present owner). Born Kingsbridge, 1764. Died Plymouth, 1835.

Half length. Life-size. Oil on canvas.

About three-quarter face, turned to right, the eyes looking out from the canvas in the same direction. Costume, dark ordinary dress of the Society of Friends. Plain dark background. Painted about 1815, in a somewhat hard manner, before the artist had attained his full powers.

LUNY, THOMAS. *Ante*.

Two large Fishing-boats beached through surf.

18½ in. x 10½ in. Oil on canvas.

This good and well-preserved example of the artist's work forms one of a large collection of marine and other paintings in Mr. Hingston's possession. On the beach in foreground is a timber groin, against which a man leans in conversation with another resting on the stern of a boat, of which about half only is shown, on the extreme right. In the distance, on the left, is a cutter in sail, and a brig at anchor.

The Committee hope to be enabled in a future Report to furnish a more complete account than the lists already given of the valuable collections of Works of Art in the Three Towns.

IN THE TOWNHALL, TIVERTON.

Artist unknown, but query COPLEY, JOHN SINGLETON, R.A., Boston, U.S.A., 1737. Died in London 1815.

King George the Third.

Full length. Life-size. Oil on canvas.

This portrait, believed to have been presented to the Corporation by one of the Earls of Harrowby, represents the king, at about the age of 40, standing on a black and white inlaid pavement; the face represented in full, with eyes looking at the observer; the light

falling from the left; habited in court dress under a long velvet robe, trimmed with ermine and lined with white; the left hand shown against the lining of the robe; a pillar and looped curtain in the background.

In the same Townhall are the following portraits, all of life-size, in oil on canvas:

George I., II., III. Three half length portraits, in royal robes, by unknown artists.

The late Right Hon. Viscount Palmerston, M.P. Seated; artist unknown.

The late Right Hon. William Nassau Massey, M.P. Standing; painted by Charles Mercier. The two last-named were presented to the Corporation when the borough was represented in Parliament by their subjects.

The late John Heathcoat, Esq., M.P. for Tiverton. By an unknown artist.

The late Francis Hole, Esq., J.P. for Tiverton. By "Partridge, painter to the Queen."

The two last-named are represented seated.

aire,

IN THE TOWNHALL, TORRINGTON.

J.C.B.

COSWAY, RICHARD, R.S.A. Portrait and miniature, 4 ft. 7 in. 1821.

Born at Tiverton. Died at Bickton 3rd February, 1748.

Portrait of the late Lord Rolle, and by him, and greatly distinguished. Full length. Life, 4 ft. 11 in. Oil on canvas. He entered the Corporation of Tiverton in 1700, and is the Bay of St. Domingo on the 1st of June, 1700, and is the passage of the Dardanelles.

This portrait, painted by Lord Rolle, depicts him standing on the 1st of June, 1700, and is the passage of the Dardanelles. On a table to the right of the Admiral is a table with the right arm-chair. He was created a baronet in 1813, and is the passage of the Dardanelles. "Magna Charta" arm-chair. He was created a baronet in 1813, and is the passage of the Dardanelles. holds up the baton to left. The August 31st, 1817. The Admiral is dark wall, uniform, bareheaded, in action, at the command, and pointing with his right hand to the right.

Portrait of the late Lord Rolle, and by him, and greatly distinguished. Full length. Life, 4 ft. 11 in. Oil on canvas. He entered the Corporation of Tiverton in 1700, and is the Bay of St. Domingo on the 1st of June, 1700, and is the passage of the Dardanelles. On a table to the right of the Admiral is a table with the right arm-chair. He was created a baronet in 1813, and is the passage of the Dardanelles. "Magna Charta" arm-chair. He was created a baronet in 1813, and is the passage of the Dardanelles. holds up the baton to left. The August 31st, 1817. The Admiral is dark wall, uniform, bareheaded, in action, at the command, and pointing with his right hand to the right.

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Mr. Pengelly is represented seated in a basket chair; the figure and face in full, and the eyes looking straight out from the canvas with characteristic earnestness; the light from the right. Costume, ordinary black morning dress. On a stool on the left are some books, papers, pens, etc., one book being open on the arm of the chair; on right and rather behind the figure, a terrestrial globe. Both hands are shown at rest. Background very subdued, and showing faintly a portion of the frame of a picture on wall. This portrait, of high excellence as a likeness and work of art, was exhibited at the Royal Academy Exhibition of 1882. It has not been engraved, but has been photographed, and copies, produced by the carbon process, were printed for the subscribers.

AT THE TOWN HALL, TORQUAY.

MORRISH, SYDNEY, S. Born at Exeter, 1836, living at Torquay.

William Kitson, Esq., of Torquay. Born 6th April, 1800.

Died at Torquay 9th April, 1883.

dr.

Full length. Life size. Oil on canvas.

about Mr. Kitson, during all his life a leading inhabitant of Torquay, is represented standing on a Turkey-carpeted floor, the figure resting mainly on the right leg, the left being advanced in an easy position; face and figure are represented, the eyes regarding the spectator; light from the left; morning costume, the coat and waistcoat almost black;

This good and true portrait, clad in dark buff; black necktie over small portion of a large collar; the right hand hanging suspended by the thumb Hingston's possession. pocket; the left, bent, the knuckles, rests on groin, against which a bag on a green baize cover the table, on which are resting on the stern of a boat with red tape, a waste-paper book, and a on the extreme right. In the floor, at the extreme end, is a waste-paper sail, and a brig at anchor. On the floor by its side are gloves on

The Committee hope to be enabled to draw on right ground formed furnish a more complete account of the valuable collections of V and sky. To find a glimpse

IN THE TOWN

Artist unknown, but query (Boston, U.S.A., 1737. Die

King George

Full length. Life

This portrait, believed to have been painted by one of the Earls of Harrowby, age of 40, standing on a black and white represented in full, with eyes looking

the eyes look at the spectator; costume, black frock-coat and trousers, with waistcoat of dark grey, having its two upper buttons unfastened; black necktie under a white linen collar following the curve of cheek; the left hand rests easily on the table; whilst the right, raised to the waist, holds a pair of spectacles. Behind the figure, on the left, is a marone leather-covered easy-chair; on the table lie a calf-bound book, an inkstand, and quill pen; plain dark background, with red curtain over the table on the extreme right. This portrait, signed by the artist, with the date 1865, was presented to the town in November of that year. It has a tablet at the foot thus inscribed: "Henry Cranmer March-Phillipps, Esq., J.P. In commemoration of his long and valuable services to Torquay by numerous friends and fellow-townsmen, 1865."

WEAR HOUSE, NEAR EXETER,

THE SEAT OF SIR JOHN THOMAS BULLER DUCKWORTH, BART.

IN THE MUSIC ROOM.

BEECHEY, SIR WILLIAM, Knt., R.A. Burford, in Oxfordshire, 1753-1839, Hampstead.

Portrait of Sir John Thomas Duckworth, Bart., G.C.B.

Three quarter length to knees. Life size. 3 ft. 7 in. x 4 ft. 7 in.

Oil on canvas.

The subject of this portrait was the son of the Rev. H. Duckworth, rector of Fulmer, Bucks, and was born in February, 1748. His family was anciently settled in Devonshire. He entered the navy in 1759, under Admiral Boscawen, and greatly distinguished himself in Lord Howe's action on the 1st of June, 1794. Among his many brilliant services may be mentioned his action with the French fleet in the Bay of St. Domingo on February 6th, 1806, and his forcing the passage of the Dardanelles on February 19th, 1807. He was created a baronet in 1813, and died at Devonport August 31st, 1817. The Admiral is represented standing, in uniform, bareheaded, in action, at the moment of giving a command, and pointing with his right hand to the left of the picture; light from right; face three-quarter to left; eyes to left; short grey hair; both hands in; the left crossed on front of chest, clasping to his body his sword, the white hilt of which is immediately under, and partly conceals the star on his breast; the red ribbon of the Order of the Bath is over the right shoulder; background of lurid smoke; apparent age about 60 years. This picture has not been engraved.

There is another painting of the Admiral by the same artist, an original, not a *replica*, which belonged to Lord St. Vincent. The attitude in both is the same, but there is a considerable difference in the features. This picture was engraved in mezzotint. One drawn by Bowyer was engraved by Cook in 1807.

KEENAN, J. *Ante.*

Portrait of William Buller, D.D., Bishop of Exeter, 1792-6. Born at Morval, Cornwall, 1735. Elected Dean of Exeter, 1784, and entertained King George III. and the Royal Family at the Deanery, 1789. Died at Downes, near Crediton, 1796.

Nearly three-quarter length. Life-size. 3 ft. 3 in. × 4 ft. 2 in. Oil on canvas.

The Bishop is represented seated; dressed in episcopal robes, and the short grey wig in use in his time; the light from right; face three-quarter, to left; eyes to left; grey eyebrows; no whiskers or beard. Both hands in; the left resting on the arm of chair; the right holding a bill, on which is written, "Entitled an Act for the further support and maintenance of Curates in the Church of England, ordered to be printed April 21, 1796." Background consisting of red curtain, and view of Exeter Cathedral on right.

LONG, EDWIN, R.A.

Portrait of the present Lady Duckworth, wife of Sir J. T. B. Duckworth, Bart., and youngest daughter of the late John Buller, Esq., of Morval.

Three-quarter length to knee. Life-size. 3 ft. 9 in. × 2 ft. 7 in. Oil on canvas.

The lady is represented standing; body turned towards the right; the light from the left; the face towards spectator; eyes looking slightly to left. Own hair, greyish. Both hands in, crossed over her lap; the right holding gold eyeglasses. Small muslin cap, with black bow; black silk dress; jet necklace and bracelets; black and gold earrings; turquoise ring on ring-finger. Reddish-grey background. A charming portrait and painting; the figure admirably posed; everything about the subject quiet, simple, and unobtrusive, as the portrait of an English lady in her home should be. It was painted in 1881, but was not exhibited.

JOHNSON, CYRUS, pupil of W. W. Ouless, R.A.

Portrait of Sir John Thomas Buller Duckworth, Bart., only surviving son of the before-named Sir John Thomas Duckworth, G.C.B.

Three-quarter length to knee. Life-size. About 2 ft. 6 in. × 3 ft. 3 in.
Oil on canvas.

Sir John, who was M.P. for Exeter for ten years from 1847, is represented seated, with three-quarter face, turned to left; light from left; eyes directed towards left. Both hands shown; left hand clasping the right. Own grey hair; grey moustache and dark grey beard. Black coat and grey trousers. Dark green background. Age at time of sitting, 70 years. Exhibited in 1879. The face is well modelled, and the painting, in its colouring, dark shadows, and general forcible manner, strongly reminds the spectator that the artist was the pupil of W. W. Ouless, R.A.

LUNY, THOMAS. *Ante.*

Naval action in the Bay of St. Domingo in February 6th, 1806.

2 ft. 9 in. × 1 ft. 11 in. Oil on canvas.

The painting represents a part of the famous naval action fought between the British and French Fleets in St. Domingo Bay, the former under the command of Admiral Sir J. T. Duckworth, K.C.B. Two British vessels are lying-to, with their maintopsails aback, after the battle, having engaged the enemy and driven two three-deckers, the *Imperial*, 130 guns, and the *Diomedé*, ashore. The French ships are heeling over on the rocks, dismasted, and are burning from stem to stern. English boats are returning from the stranded ships. Although nineteen ships took part in the engagement, only four are represented in this picture. The ships, as in all Luny's paintings, are correctly drawn; their arrangement and the general composition of the picture are most artistic.

British Fleet forcing the passage of the Dardanelles, under the command of Admiral Sir John T. Duckworth, K.C.B., on the 19th of February, 1807.

2 ft. 8 in. × 4 ft. 1 in. Oil on canvas.

This painting is not a favourable specimen of the artist's work; indeed it is intended more for a pictorial representation of a gallant deed than as a work of art. The ships, which in reality passed the batteries singly, and with a long interval between each, are here crowded together and made to appear as if they advanced in close column. Moreover the action of the squadron under Sir Sidney Smith, with the Turkish fleet, is also represented in the middle distance; there is no attempt at composition, or arrangement of light and shade; the ships are simply sailing up the strait, with wind aft, engaging the batteries on either side. The ships are admirably drawn. The sky is clear and full of light, and in perfect harmony of colour, with the slightly-ruffled sea beneath it.

A smaller picture of the same subject.

2 ft. 9 in. × 1 ft. 11½ in. Oil on canvas.

Six-line of battle-ships, with wind aft and studding sails set, are making all speed to pass the Turkish batteries, engaging the ports on both sides.

DOWNMAN, JOHN, A.R.A. Portrait and subject painter. Born in Devonshire. Died at Wrexham, in Denbighshire, in 1824. Pupil of Benjamin West, P.R.A. Practising at Exeter 1806-8.

Portrait of Lady King.

10½ × 1 ft. 1 in. Water-colour.

She was the daughter of Admiral Sir J. T. Duckworth, Bart., G.C.B.; married in 1803 to Admiral Sir Richard King, Bart., G.C.B.,

and mother of the present Sir Richard Duckworth King, Bart. The lady is seated, with a little girl in her lap; she wears her own hair, with curls over her forehead, and three circular-jewelled ornaments on front hair; black ribbon round the head. She is dressed in white; face three quarters; eyes directly forward; right arm and hand showing, the latter resting on the child who is seated on her lap, also dressed in white, and playing with a gold locket, which is suspended from her mother's neck by a chain. Background, a red curtain on right, sea, with a ship on left. Painted in 1806.

GREAT FULFORD, IN DUNSFORD, DEVON,

THE SEAT OF FRANCIS DRUMMOND FULFORD, ESQ.

Among the works of art preserved in this ancient mansion of the Fulfords, those most worthy of note are the following:

DYCK, SIR ANTONY VAN (attributed to). Antwerp, 1599–1641, London. Scholar of Rubens. First came to England in 1627.

King Charles I.

Full length. Life-size. 7 ft. 2 in. × 4 ft. 11 in. Oil on canvas.

The king is represented sitting on a throne; background, a pillar on left, and two crossed lances bearing pink pennons, on one of which are embroidered in golden letters S P Q R; the face is nearly full, facing the spectator; eyes front; light from left; dark brown own hair, with brown moustache, and the well-known pointed beard; steel breastplate; crimson robe, edged with jewels; crown on table in left; both hands shown; the right holds a plain staff as if for a sceptre, and the left rests on a very large crystal globe. Only the right leg is visible, wearing a white kid boot, fur-edged. Not dated nor signed. The George he wears is of the same small oval size as was presented by him to Bishop Juxon on the day of his execution. Tradition reports this portrait to have been presented to the Fulfords by King Charles II. It is apparently one of the many pictures of his family presented by the "merrie monarch" in acknowledgment of services rendered to his father's cause.

HULLIARD, NICHOLAS, portrait and miniature painter, also jeweller and goldsmith to James I. Exeter, 1547–1619. London.

Queen Elizabeth.

Bust portrait. Life-size. 1 ft. 7 in. × 1 ft. Oil on panel.

The Queen is apparently about thirty years of age; faces the spectator; face rather inclined to right; eyes front; hair flaxen, wavy, and combed back off the forehead; starched ruff; pearl necklace; rich brown flowered dress, neck and front of chest showing; hands not in; light from left; not signed nor dated. This is a very interesting picture, and a good specimen of the artist's work. Oil paintings by him are very rare, although his miniatures are not unfrequently met with, and obtain very high prices.

UNKNOWN.

James Fitzroy, Duke of Monmouth.

Born at Rotterdam, 1649; invaded England, June, 11th, 1685; defeated at Sedgemoor, July 5th; beheaded in London, July 15th.

Half length. Natural size. 2 ft. 6 in. x 2 ft. 8 in. Oil on canvas.

Long flowing brown wig; face three-quarter to left; light from right; eyes front; steel breastplate; arms clothed in brown material, embroidered with flowery pattern; hands not in; apparent age about thirty-five; not signed nor dated. As the Duke died in his thirty-seventh year, it is probable that this portrait was taken not long before his flight to Holland, in 1684.

POURBUS OR PORBUS, FRANCIS, the Elder, son of Peter Pourbus, the artist. Bruges, 1540-1580. Pupil of his father.

Egmont, Lamoral, Count of.

Born in Holland, 1522; ambassador to England, 1554; distinguished himself at the battle of St. Quentin, 1557; imprisoned by Alva, at Ghent, September, 1567; executed with Count Horn at Brussels, 1568.

Natural size. 1 ft. 8 in. x 1 ft. Oil on panel.

This is a bust portrait; three-quarter face to left; narrow fluted frill round neck; steel armour; short light brown own hair; light brown moustache and pointed beard; hands not in; light from left; not dated nor signed; age apparently about 45 years.

MYTENS, DANIEL, the Elder. Born at the Hague. Came to England probably in the latter part of the reign of James I. Portrait painter to Charles I. He left England soon after the arrival of Van Dyck, and was living at the Hague in 1656.

John, Second Baron Poulett. A Royalist officer in the Civil War. Succeeded his father, the first baron, 1649. Died 1665.

Three-quarter length. Natural size. 4 ft. x 3 ft. Oil on canvas.

The figure is standing; face three-quarters to right; light from left; eyes front; light brown own hair; ditto moustache and pointed beard; turned-down lace collar; very dark-coloured, small-patterned plaid dress, slashed in arms with white; jewelled belt and jewelled hilt to sword; lace gauntlet cuffs; both hands in; right resting on hip, with fingers bent inwards; left holding white glove, ornamented with lace; hilt of sword projecting at back of left hand; dark background; red curtain on upper right hand corner; age of the subject about 45 years; not signed nor dated.

KNELLER, SIR GODFREY, KNT. Lubeck, 1648-1723, England. Pupil of F. Bolard; received some instruction from Rembrandt. Came to England in 1674. Employed by Charles II., James II., and William III.

Colonel Francis Fulford. M.P. for Callington. Died 1703.

Three-quarter length. Natural size. 4 ft. 1 in. x 3 ft. 2 in. Oil on canvas.

Standing; face three quarters to right; light from left; eyes front; full dark wig; light brown coat, with white falling neck-

band ; both hands in ; right resting on some object, forefinger extended, pointing downwards ; left hand doubled back, and admirably foreshortened, resting on left hip ; dark purple cloak up to waist ; dark background ; not signed.

WISSING, WILLIAM, portrait painter. Amsterdam, 1656-1687, Burleigh. Came to England about 1680. Was first employed by Lely, and after his death became fashionable, and the rival of Kneller.

King William III.

Oval. Natural size. 2 ft. 8 in. \times 1 ft. 11 in. Oil on canvas.

The king is represented half length, with the usual flowing wig of brown hair ; three-quarter face to left ; light from right ; eyes front ; brown colour. He is dressed in regal robes, with the George suspended from his neck by a gold chain or collar ; the George ornamented with jewels. Hands not in ; dark background ; not signed nor dated.

LELY, SIR PETER, KNT. Westphalia, 1617-1680, London. Came to England in 1641, and became the leading portrait painter of the day.

Miss Fulford.

Natural size. 1 ft. 4 in. \times 1 ft. 2 in. Oil on canvas.

Head and shoulders portrait ; full face ; light brown hair, drawn back from face ; eyes front ; light from left ; neck and front of breast shown ; frill round the top of dress. Hands not in ; not signed.

LAWRENCE, SIR THOMAS, KNT, P.R.A. Bristol, 1769-1830, London.

Miss Louisa Caroline Colleton, only daughter of Sir John Colleton, Bart. Married to Admiral Richard Graves, of Hembury Fort, near Honiton.

Oval. Tempera on paper. 12 in. \times 12 in.

To waist ; powdered hair, drawn off from face ; curls hanging down neck, falling in front over left shoulder. Kerchief, white striped with orange, over the head ; neck and chest shown. Dress, white edged with orange ; sash, sky-blue. Hands not in ; three-quarter face to right ; eyes to right ; light from left. This portrait was painted when the artist was 15 years of age.

GUARDI, FRANCESCO. Venice, 1712-1793. Pupil of Canaletto.

View of St. Mark's Place, Venice.

1 ft. 9 in. \times 2 ft. 6 in. Oil on canvas.

LUNY, THOMAS. *Ante.*

Plymouth from the Hoe.

10 in. \times 11 in. Oil on canvas.

A frigate is putting to sea, full sail, between the Hoe and Drake's Island ; a boat, with men rowing towards the foreground.

FRANCK, FRANCIS, called the Elder. Antwerp, about 1546-1616, Antwerp.

The Battle of Gravelines.

8 ft. x 12 ft. 3 in. Oil on canvas.

A large and carefully-drawn battle scene. On looking at the picture, and observing how carefully every detail is represented, it is impossible to doubt that the artist painted it from descriptions furnished to him by a combatant. It is a most interesting historical picture, and illustrates the account of the action so graphically given in Motley's *Rise of the Dutch Republic*. In the foreground Count Egmont, on horseback, directs the movements, amidst a great number of figures mounted and on foot. The middle distance is taken up with the various columns engaged, consisting of cavalry, pikemen, and arquebusiers. In the distance is the sea-coast, covered with sand dunes; and on the sea, in the extreme distance, are seen three ships of the English fleet firing into the rear of the French army; a manœuvre which shook the confidence of the French, and which, combined with the charge of the Flemish cavalry, decided the victory. Although this picture is attributed to Francis Franck, it is not improbable that it was painted by Constantine Franck, a great painter of battle pieces.

ABBOTT, J. W., *Ante.*

Landscape.

2 ft. x 2 ft. 5 in. Oil on canvas.

A wooded landscape, with two figures and two donkeys in the foreground; a dark pool of water in left lower corner; blue sky with clouda. A picture in design and treatment resembling that preserved in the Devon and Exeter Institution and described in last year's Report.

ROESTRATON, PETER. Haarlem, 1627-1698, London. Pupil of the famed Francis Hals. Came over to England in the reign of Charles II.

Crockery and Glass Vessels.

2 ft. 9 in. x 3 ft. 6 in. Oil on canvas.

A table, half covered with a white linen cloth; a basket containing glass drinking-vessels in centre; on right a brown earthenware jar of the greybeard type; on left a square glass bottle and porcelain teacup, admirably painted.

By same artist.

Astronomer.

5 ft. x 3 ft. Oil on canvas.

The astronomer, an old man, seated on left; brown earthenware crockery on right.

FOURTH REPORT OF THE COMMITTEE
TO OBTAIN INFORMATION AS TO PECULIAR
TENURES OF LAND,

AND AS TO CUSTOMS OF MANOR COURTS IN DEVONSHIRE.

FOURTH REPORT *of the Committee—consisting of Mr. R. Dymond, Mr. G. Doe, Mr. J. S. Amery, Mr. G. W. Ormerod, Mr. J. Brooking Rowe, and Mr. Edward Windeatt (Secretary), on Peculiar Tenures of Land in Devonshire, &c.*

Edited by EDWARD WINDEATT, Honorary Secretary.

(Read at Newton Abbot, July, 1884.

To the present Report are appended translations of some Court Rolls of the Castle of Totnes, containing features of somewhat special character; also some particulars, gathered from the Rolls of various Manor Courts, to illustrate peculiarities of land tenure and manorial customs in this county.

The books or parchment rolls, on which the proceedings of these Courts were formerly recorded with great regularity, form an invaluable source of knowledge of the rural customs and mode of local government in past times. The majority of them have probably been lost, scattered, or destroyed; but in spite of the havoc caused by accident, carelessness, and wilful neglect, such records may still be found in the muniment-rooms of country houses and in the offices of professional men, in far greater abundance than is generally suspected. Now that the historical value of these documents is becoming more and more recognized, it may be hoped that the progress of destruction may be stayed, and that the Committee may be enabled to present in future years many more illustrations of the important subject of their appointment.

ROBERT DYMOND, Chairman.

EDWARD WINDEATT, Hon. Sec.

THE CASTLE OF TOTNES.

The following is a translation of some Court Rolls relating to the Castle of Totnes, giving the names of those who held land for military service in connection with the castle, as well as the lands they held.

I have given in some instances by means of footnotes the modern name and locality of the places mentioned.

At the end I have compiled a list of the names of persons and places named in the Rolls relating to the Castle of Totnes, dated 15 and 16 of Henry VIII., 20 and 21 Henry VIII., and 30 and 31 Henry VIII.

Great Totton.—The Court-leet of the fee of the Castle in that place, held on the fourteenth day of October, in the twentieth year of the reign of King Henry the eighth, &c.

Fines for suit as well as homage, & for not repairing the victualling. } To this Court came Lord de la Ware (viiij^a) for * Hempston Cantelhoe; John Kyrkeham, knight (iiij^a), for † Ryddemore, Wokenbery, Marelewyl, & Fugglauston; John Wyse, armiger (ij^a), for ‡ Raddon, Allersford, § Scottyscomb, & the Lady Marchioness of Dorset (iiij^a) for the Manor of Wodeford. And they give for a fine as appears after their names for suit as well as homage this year. Likewise for not repairing the victualling of the Castle aforesaid this year, to wit, until the Court-leet of Saint Michael the archangel next.

Fines for suit as well as homage, liij^s viij^d } To the same Court comes John Copleston, of Copleston (iiij^a), for Wayssheborne, Badesyn; & the Prioress of Corneworthy (xx^d) for || Tydworthy & Alleluy. And they give to the lord as a fine, as appears after their names, for suit as well as homage, for this year, to wit, until the Court-leet of Saint Michael the archangel next.

Distrained. The tenants of Bryxton Raynegh, the tenants of Northebovy, the tenants of Southehuysshe, the tenants of ¶ Shagh & Chechelburgh, the tenants of Byckeford Wallas & the tenants of ** Waysshefyld, and the tenants of Southepole & †† Scobhell, and the Prior of Plympton, to do homage and fealty to the lord for the lands & tenements which they hold individually from him as from the Castle aforesaid for military service. And they are distrained.

* Hempston Cantilupe, or Broadhempston.

† Ryddemore, alias Rynmore, Ringmore, near Bigbury; Okenbury in Kingston parish; Marlewell and Langston in Ringmore parish.

‡ In Mary Stow parish.

§ In Kingston parish.

|| Tidworthy and Allalegh in Cornworthy parish.

¶ Shagh.

** Washfield, near Tiverton.

†† Both in South Pool parish.

Amercements, ^{ij^a} At this Court the tenants of Bryxton Raynegh (ij^d), the tenants of Northebovy (ij^d), the tenants of Southehuyshe (ij^d), the tenants of Shagh & Chechelburgh (ij^d), the tenants of Byckeford Walles (ij^d), the tenants of Wasshefyld (ij^d), the Prior of Plympton (ij^d), & the tenants of Southepole & Scobhell (ij^d), were solemnly called this day, and did not appear, but made default of suite of court, therefore they are amerced.

Amercements, ^{ij^a} The Bailiff is amerced because he did not distrain the tenants of Northebovy (vj^d), the tenants of Southehuyshe (vj^d), the Prior of Plympton (vj^d), the tenants of Southepole & Scobhell (vj^d), to repair the victualling of the Castle aforesaid. And he is distrained.

Sum of this Court, xxiii^a viij^d.

The following is a portion of a roll which differs from the one already given, and is of rather an earlier date:

Great Totton—The Court Leet of the fee of the Castle in that place held on the twentieth day of October, in the fifteenth year of the reign of King Henry the eighth.

Amercements, ^{vjs viij^d} The Bailiff is amerced because he did not distrain the heirs of John Northbury, knight (ij^d), for Bryxton; the Lady Cecilia, Marchioness of Dorset (ij^d), for Wodford; lord de la Ware (ij^d), for Hempston Cantelho, alias Brodhempston; the tenants of Northbovy; lord Hastyns (ij^d), for Southepole & Scobehill; William Courtenay, knight (ij^d), for Southhuyshe, the tenants of Southyll (ij^d), the tenants of Shagh (ij^d), the tenants of * Worthele (ij^d); John Kyrkeham, knight (ij^d), for Rydmore, alias Rynmore; the Prioress of Corneworthy (ij^d), for Tydworthy; Antony Fetypase (ij^d), for Bykeford Wallys; Edward Pomeray, knight (ij^d), for † Sydenham, Wagh-sen, & Collaton; the tenants of Sydenham, Raddon, & Alreford (ij^d), the Prioress of Corneworthy (ij^d), for ‡ Westcornworthy; the heirs of Alicia Rayslegh (ij^d), the heirs of Richard Locke (ij^d), and Antony Worthe (ij^d), for Wayshefyld; the tenants of Wayshebornebawsen (ij^d), the tenants of Chechelburgh (ij^d), the tenants of Scattyscomb (ij^d), the tenants of Thurleston (ij^d), the tenants of Chorselegh (ij^d), & the tenants of Barght (ij^d), to do homage and fealty to the lord for the lands and tenements which they hold from him for military service; and they distrain the heirs of Malston (ij^d) & the heirs of Calsyngton (ij^d) for the same. And they are distrained.

* Worth-hele, in Ermington.

† There are two Sydenhams in Mary Stow parish.

‡ Westcornworthy is now the village of Cornworthy.

*Names of Persons and the Manors they held under the Lord
of the Castle of Totnes.*

Lord de la Ware, for Hempston Cantelhoe, *alias* Brodhempston.

John Kyrkeham, miles, for Ryddemore, *alias* Rynmore, Wokenbury, Marlewyl, and fugglauston.

John Wyse, armiger, for Raddon, Allersford, Scottyscomb, and Sydenham.

The Lady Cecilia, Marchioness of Dorset, for Wodeford.

John Coplestone of Coplestone, for Wayssheborne Bawson (Badesyn).

The Prioress of Corneworthy, for Tydworthy, Alleluy, and Westcorneworthy.

The heirs of John Northbury, miles, for Bryxton.

Lord Hastyngs, for Southpole and Scobehill.

William Courtenay, miles, for Southuyshe and Galmeton.

Antonius Ffetyapse, for Byckeford Wallys.

Edward Pomeray, miles, for Sydenham, Waghzen, and Collaton.

Thomas Worthe (Antony Worthe, son and heir of Thomas), one-third of the manor of Wayshefyd.

Alicia Rayslegh, a moiety of Wayshefyd.

Richard Locke (Johanna, his daughter and heir, is also next of kin to Alicia Rayslegh), a moiety of Wayshefyd.

Thomas Wevell, lands in Bryghtrycheston.

Katerine Dudley, for Northbovy.

*Names of Persons not identified with the names of any
Manors.*

The Prior of Plympton; William Stonyard (Stonerd), miles; Adrian Ffortescue; Oliuer Wyse; John Lord Fitzwaryn; the heirs of Malston; the heirs of Calsyngton.

*Names of Manors not identified with the names of any
Person.*

The tenants of Shagh (Sthagh) and Chechelburgh; Bryxton Raynegh; Southyll; Worthele; Thurleston; Chorslegh; Barght (Bargh); Thorleslegh; Blachesworthy; Backemore and Honyland; Byckott, Thorne, and Tolslo; Tavy Saint Marie; Downe Thomas; Langdon.

J. S. A.

The small manor of High Bickington has the following customs :

1. The copyholds are granted for lives.
2. A widow has a life interest, called a widowhood, in the whole of the copyhold lands held by her deceased husband at his death, or at any time previously, unless the widow has released her right.
3. The widowhood can be forfeited by the act of the widow only.
4. The widowhood is held by the widow whilst single and chaste.
5. The widowhood is irrecoverably lost by remarriage ; but if forfeited by unchastity, it may be regained by the unchaste widow attending at the Court Baron held next after the presentment of unchastity, bestriding a ram with her face to the tail, and, holding the tail in her hand, repeating aloud a certain form admitting the offence, and praying to be admitted to the lands again.*
6. The copyholders may not reside away from their copyholds without the lord's licence.
7. The lord has the right to re-enter and possess unoccupied or dilapidated dwellings on the manor.
8. A heriot of the best beast on the copyhold is due on the death of the copyholder.

[Contributed by Mr. G. Doe, the information being obtained from Mr. George Stawell, solicitor, Torrington, grandson of a former rector of High Bickington, who as rector was lord of the manor.]

MANOR OF STOKEFLEMING.

Having obtained possession of a number of parchment rolls relating to the above manor, situate near Dartmouth, I have transcribed such portions as may be of interest and bear upon the matters relegated to the Land Tenures Committee.

The Manor of Stokefleming. The Estreats of the Court of the Manor aforesaid, there held the 23th day of July, in the nyneteenth yeare of the Reyne of our Sovrayne Lord Charles the Second over England, Ano. Domi. 1667.

Nicholas Roope, Esq^r, Richard Hawkings, gent., Robert Edgcombe, seni, John Goodridge, Alexander Crispin, Thomas Harvey, Walter Cliffe, gent., John Roope, gent., Edward Luscombe, James Halswell, William Elston, Nicho. Garland, Francis Winter, Elynor

* A similar custom is referred to in Blount's *Peculiar Tenures*, as observed in the manor of Torre, Devon.—R. D.

Luscombe, Jacob Phillips, Executrix Arthur Woolston, John Pin-haye, Lewis Skinner, Honor Roope, Ibbote Knowles, Thomas Adams, John During, John Knight, George Garland, Walter Hingston, Alice Bourton, Edward Lidston, Customary & convenconary Tenants of this Manor for their amersmts for default of suit at this Court.

[Against each name above it is marked *iii^d*, the amount of the fine.]

Of William Elston, *seni*, *xii^d*, for not repaying the Buddle formerly pssented, is amersed.

Of Robert Edgcombe, for not appearing to answer, is amersed.

[This court appears to have been held quarterly, and the other entries are of similar character.]

From another parchment roll, containing the proceedings of the Court Leete and Court Baron of Thomas Southcott, Esq., Lord of the Manor of Stoke Fleming for the years 1654-5, are extracted the following curious entries :

Vincent Paige Tithingman *xii^s iiiij^d*, for his fyne for not retornynge a Jury of honest and lawfull men for the service of the Commonwealth and the Lord of this Manor at this Court Leete and Baron according to the Precept hee received.

To this Court cometh George Splatton, and doth undertake the severall offices of Tithingman and Aletaster within this Manor for his yeere to come, in the place and steed of M^r John Smith, and is sworne.

The said Jury come and present Gilbert Ford, a Customary Tent of this Manor, for not repayinge the Bridge in Crustmeade, which he ought to repayre, the same beinge a Market waye and Church-path.

To this Court cometh the said homage & doe psent : That Joan Roope, widdowe, a customary Tenant of this Manor, who held of the Lord of this Manor by Coppie of Court Roll according to the custome of this Manor one Messuage and Tenement and one farthinge of Land, wth the appurtence, dyed since the laste Court, whereupon there happeneth to the Lord of this Manor a best beast for a herryott ; to witt one Cow, the which herryott was delivered to the Lord of this Manor by the Baylieffe of the Manor.

Also the said Jury doth present that Peter Crosse doth divert and turne the water out of his right course in the meadow called the Orchard in Stoke Towne, to the common hurt and annoyance of the Tenants of this Manor.

To this Court cometh the said homage, and present that an ancient bond stone at Swanaton which parted this Lordshipp from the Lands belonging to the Towne of Dartmouth is removed, but by whom they know not. The Court doth order that the Tithingman aforesaid do set and fixe the same in his ancient place before the next Court upon payne of *iii^s vi^d*.

E. W.

BOROUGH AND MANOR OF MODBURY.

This borough and manor at present belongs to Mrs. Crespin, who holds a Court Leet with view of Frankpledge, at which the Portreeve and other borough officers are elected. The Portreeve holds a court in the spring of the year with a dinner, which is paid for from the tolls taken at St. George's Fair.

The ancient Guild of St. George, which before the suppression of religious guilds consisted of the Portreeve and commonalty of the borough, had a right to hold a nine days' fair, commencing on the eve of St. George's-day. At the Reformation the right passed to the lord of the borough.

The fair is still held on 3rd May, being old St. George's-eve. On that day the fair is proclaimed by the Town Crier in the presence of the Portreeve and borough jury at the centre of the town, once the Market Cross.

The crier having made three "Oyez," and required all persons to keep silence, makes the following proclamation :

The fair called St. George's Fair, within this borough of Modbury, is now held in the right of Mrs. Mary Crespin, lady of the said borough, in whose name and behalf, and according to the statute of second year of King Edward III. cap. 15, we do proclaim and publish the same, and that it is to continue for nine days from hence, being St. George's-eve (Sunday excepted by 27 Henry VI. c. 7), during which time it is the duty of all persons who shall come to this fair (especially the inhabitants and officers of this borough) to use their utmost endeavour to preserve the Queen's Majesty's peace within this borough, and to cause every one that shall disturb it to be punished for so doing; and if any matter shall happen to arise relating to any bargain within the jurisdiction or time of this fair it is determinable by a Pye-powder Court, wherein the steward of this borough will be ready to perform his part. By the statute of second and third of King Philip and Queen Mary, every owner of a fair or his deputy is to appoint a toll-taker or book-keeper to sit there from ten of the clock in the forenoon until sun-setting on pain of forty shillings; and therefore I do, on behalf of the lady of this fair, appoint A. B. to be the said toll-taker. All persons are to take notice, and are required to pay toll for all horses, cattle, and other quick goods that shall be sold or exchanged within this fair, and also coverage and stallage according to the custom of this borough, and no person ought to take more on pain of being punished for so doing.

By the statute of 31st Queen Elizabeth, every seller or exchanger of a horse, nag, or a mare in a fair (who is unknown to the toll-

taker) is to procure a creditable person known to him to vouch the sale or exchange thereof, under pain of five pounds, and every false voucher forfeits the like sum. The names of the buyer and seller or exchanger, their abode, and additions, and the colour and one mark at least of the horse, mare, or nag sold or exchanged, ought to be entered on the toll-book to warrant the sale, in case the same shall appear to be stolen. All which is now published, as well on behalf of the lady of this borough, as for the quiet and safety of all persons who are or shall be concerned in this fair, and we hope that due regard will be paid thereto. God save the Queen.

In the evening a Fulfilling Court is held, after which the Portreeve, officers, and jury partake of a bread-and-cheese supper, which is paid for by a small fee from the Lord of the borough and each member of the Court.

The Court Leet or Law-day is held in the autumn. The jury are summoned by the Bailiff on authority of a precept signed by the Lord of the borough.

This Court is usually presided over by the High Steward of the borough, who, after swearing the jury, reads the following charge, making such additions or comments as he considers advisable to meet the requirements of the times :

A Court Leet is a Court of Record ordained as well for Punishing crimes and misdemeanours against the Crown as for Reformation of Publick offences committed within its Jurisdiction & precincts, But those which are to be punished with Loss of Life or Member are only enquirable & presentable here, And are to be certified in such proper manner as I shall hereafter sett forth to ye ; This Court has Power to Punish Offenders by the Common Law, not by Statute, unless the Statute gives authority, but in no case with Death. Petty Treason, Murther, Felony by the Comon Law, Felony by the Stat Law, are here inquirable by the Jury & presentable, but not punishable. However you are to take notice of such as are guilty thereof in regard to the Safety of Yourselves & Fellow Subjects.

For a woman to Kill her husband, a Clerk his ordinary, or a Servant his or her Master or Mistress, is *Petty Treason*.

The wilfull or Felonious Wounding or Killing of any person whatsoever upon malice fforethought, so as the party wounded or hurt dye within a year & a day after the Fact, is *Murder*.

By the Common Law—To have Carnall knowledge of a woman against her will is Felony, as well in the aiders as in the Principle, or to carry away a woman against her consent, tho' with an Intent to marry her, is Felony. To Deface the Physiognomy of a man, woman, or child by cutting or pulling out the Tongue or Eye, or Servants imbezilling their Master or Mistress's goods, or if steal but to the value of 1^d, or rob any Church or Dwelling house, or any person or persons on the Highway, its *Felony*.

By the Stat Law—there be diverse ways of committing Felony & twill take up too long time to enumerate them. But one in particular is directed to be taken notice of in a Court Leet. And it was made in the 1st year of King Geo: ye 1st for preventing Tumults & riotous Assemblies, and thereby it is enacted (*viz^t*) That if 12 or more persons being riotously assembled together & being required by a Justice or Peace or other head officer by Proclamation in the King's name to Disperse y^mselves & Depart to their habitations or lawful Business shall continue together one hour after such Proclamation, it shall be adjudged Felony without Benefit of Clergy. And the Proclamation runs thus—Our Sovereign Lord the King chargeth & commandeth all persons being assembled immediately to disperse themselves & peaceably to Depart to their habitations or their lawful Business Upon the Pains contained in the asd act. And it is also enacted—That every such Justice & head officer are required on notice or knowledge of such unlawful Assembly to resort to the Place & make such Proclamation as asd. And if such persons continue together one hour after such Proclamation made they are to be apprehended & carry'd before a Justice of the Peace in order to be proceeded against according to Law, and if any of the persons so unlawfully assembled shall be kill'd, maim'd, or hurt in the taking, it shall be excused in the persons so doing; and if any person so unlawfully Assembled shall Demolish or Pull down, or begin to Demolish or Pull down, any Church, Chapell, or other building for Religious worship, certified & registered according to the Stats of the first of Will^m & Mary, or any Dwelling house, Barn, Stable, or other outhouse, its Felony without benefit aforesaid; & if any person or persons shall with force wilfully oppose the said Proclamation, or hurt any person that shall begin or go about to make the sd Proclamation, its Felony without benefit of Clergy.

And it is presumed, That this act being directed to be read at every Leet was, that the Subjects may not pretend Ignorance in case they should be charged with the Breach of it.

But I hope, Gents, That none of the Crimes & offences which I've heretofore given & mentioned have been committed within this Borough. However, if any such have been & shall come to yo^r knowledge, you are to present the same to me, & I am to make return thereof into the Kings Bench or before the Judges of Assize or Justices of the peace, in order to bring the offenders to a proper Punishm^t for the same. For they are in this Court only inquirable & presentable. But, Gentlemen, what you are by your oaths obliged to enquire into are both presentable & punishable, and what I shall endeavour to make known to you in the Briefest manner possible.

You are to enquire into & present all Forestallers, Regrators, & Ingrossers; for they are very Detrimentall in raising & enhancing the Price of Corn & other Provisions.

A Forestaller is one that buys Corn or other victualls & Pro-

visions that are carrying to a fair or Markett to be sold before it be brought into the fair or Market.

A Regrator is one that buys Corn or other dead Victualls in open fair or Markett & sell the same again in some other fair or Markett within four miles of the same place.

An Ingrosser is one that buys corn on the ground (otherwise than by demise or grant), or any butter or cheese or other victualls, with an Intent to sell the same for an unreasonable Profit.

You are duely to present all such free & conventionary Tenants & Resiants of this Borough as have not appeared here this day to do suit & service as required of them at this Court.

If any of the Officers of this Borough, as Portreeve, Constables, Aleasters, Searchers & Seaters of Leather, Pigdrivers, &c., have neglected the due performance of their respective offices, you are to present them.

You are also to duly inquire into & present all Bloodsheds, Escheats, Treasuretrove, Waifs, Estray.

If any person within the Jurisdiction of this Court hath wilfully or thro' malice drawn blood from the person of another, it's here punishable.

If any Tenant Comitts Felony by laying violent hands on himself in any manner whatever, or if a Bastard (for in the eye of the Law no one else can) dye without heirs generall or Speciall, or without Disposing his lands, they come to the Lord of the Manor by Escheat.

If any money, gold, Silver, Plate, or Bullion, is found hid in the earth, and no man knows the proper owner thereof, tis a Treasuretrove, and the property belongs to the Lord of the Mannor.

If Goods are Stolen & lost by a Felon on his being pursued within the Mannor, tis forfeited to the Lord as a waife.

Estrays are Cattle found within a Mannor & no proper owner known within a year & a day.

If any free Tenants of the Burrough are dead their Deaths are to be presented & what is due to the Lord thereon.

Also if an alienation is made of any Lands within this Borough you are to present it, That the Lord may know the proper Tenant of the same and from whom to Demand his rent.

You are likewise to enquire after & present persons that live Dissolute lives, such as do not labour & have not whereby to live, and yet seemingly live well. As also Common Drunkards, Comon Swearers, Eves Droppers, such as hearken after news with intent to spread it abroad and cause Discord and Enmity among the neighbourhood.

If any Butchers, Brewers, Bakers, or Victuallers have conspired to sell but at certain Prices, or have put to sale anything unwholesome for man's body. Or if any Artificiers, Labourers, or Handycraftsmen have combined to work but at certain Prices or at certain times, or shall refuse to complete the work they've undertaken. Or

if any persons have used false weights & Double measures ; that is, a great to buy by & a small to sell by, in Deceit of the people, its here punishable.

If any Rescous hath been made ; that is, where Cattle driving to be impounded for a Trespass are taken away, or any Pound Breach hath been made & Cattle illegally taken thence without due Delivery, its here to be inquired into.

If any of the Highways or Streets within this Leet are out of Repair, or the Potwater annoyed, or other water turn'd out of its usual course, or any incroachment made on any of the Lord's Lands or the ways or Passages Streighten'd, or if any person Detain any of the Lords rents, Duties, or services, or any Comon Brewer for sale does not grind at his Mill, you are to present each & every one for his particular offence.

And Lastly if any one from 16 to 60 has lived a year in the Leet & has not taken the oath of Allegiance to, &c., he ought to be presented.

The Portreeve and officers elected at the Court Leet are sworn by the Steward if he be present, and a dinner is held in the evening at the expense of the Lady of the manor. If the Steward is not present at the Court a Fulfilling Court is subsequently held, at which the jury make their presentments and the officers are sworn, after which a bread-and-cheese supper is held, as at the proclamation of the fair. The borough officers consist of the Portreeve, two Treasurers, two Aletasters, two Pig-drovers or Swineherds, a Scavenger, and a Crier.

The Treasurers administer the funds of the borough for purposes of general welfare ; as water supply, street improvements, &c. This fund receives all heriots paid on deaths of burgesses and leaseholders. The tolls from the public weigh-house or tolse-house used also to be given ; but on its removal to widen the street, the sum of £3 is paid in lieu by the Lord annually. The accounts are audited in the open Court and countersigned by the High Steward. The Treasurer's book is more than two centuries old, and contains the complete accounts for the whole time. All other matters connected with the Borough Courts are similar to those held at Ashburton. (*Vide* Report of Committee, vol. xvi. page 181.)

P. F. S. A.

**THIRD REPORT (SECOND SERIES) OF
THE COMMITTEE TO COLLECT AND TABULATE
OBSERVATIONS ON THE CLIMATE OF DEVON
DURING 1883.**

P. F. S. AMERY, Secretary.

(Read at Newton Abbot, July, 1884.)

YOUR Committee has collected and tabulated an abstract of meteorological observations during 1883, relating to RAINFALL, TEMPERATURE, HUMIDITY, and CLOUD, taken by experienced persons scattered over the county of Devon, a comparison of which will afford a better idea of the climatic variations in the different districts than any generalization can give.

The stations recorded are not as numerous as they should be, but your Committee has rather trusted to observations made with accredited instruments by persons who observe for the Meteorological Society than sought to present a more complete but less trustworthy table, which would be almost useless for comparison.

The Secretary, on behalf of the Committee, again begs to thank those observers who have assisted him in compiling the tables by furnishing their figures direct, and, in some instances, in correction of those published in the quarterly journal of the Meteorological Society.

The particulars of the stations and observers are as follows :

STATION.	ELEVATION. feet.	OBSERVER.
Ilfracombe	25 ...	W. M. Tratham.
Teignmouth (Woodway) ...	235 ...	G. W. Ormerod, M.A., F.G.S., F.M.S.
„ (Bitton) ...	70 ...	W. C. Lake, M.D., F.M.S.
Torquay (Castle College) ...	166 ...	C. J. Harland, F.M.S.
„ (Rocombe) ...	401 ...	H. Header, F.M.S.

STATION.	ELEVATION.	OBSERVER.
	<i>feet.</i>	
Babbacombe (Kirkham) ...	140 ...	E. E. Glyde, F.M.S.
Sidmouth (Sidmount) ...	186 ...	W. T. Radford, M.D., F.R.A.S., F.M.S.
Plymouth (Navigation School) ...	75 ...	J. Merrifield, LL.D., F.R.A.S., F.M.S.
Exeter (Devon and Exeter Institution, ... }	140 ...	E. Parfitt.
Brampford Speke ...	140 ...	W. H. Gamlen.
Cullompton ...	202 ...	T. Turner, F.M.S.
Ashburton (Druid) ...	584 ...	P. F. S. Amery.
Bridgetown (Totnes)...	107 ...	T. H. Edmonds, F.M.S.
Holne Vicarage ...	650 ...	Rev. J. Gill, M.A.

EDWARD PARFITT, Chairman.

P. F. S. AMERY, Secretary.

JANUARY.

STATIONS.	RAINFALL.			TEMPERATURE IN STAND.								Cloud. 9 a.m. (9-10).
	Total.	Wet Days.	Greatest Fall.	Temperature, 9 a.m. on first day of month.	MEANS.				EXTREMES.			
					Temperature, 9 a.m.	Humidity, 9 a.m.	Minima.	Maxima.	Night Minimum.	Day Maximum.		
Ilfracombe . . .	3.22	20	.62	deg. 55.0	deg. 45.3	% 89	deg. 41.6	deg. 49.5	deg. 33.8	deg. 56.5	7.4	
Teignmouth (B.) .	3.29	23	.52	53.5	44.1	85+	40.1	49.1	31.0	54.5	7.5	
Teignmouth (W.) .	3.27	23	.38	52.8	43.9	91	39.4	49.7	32.8	56.4	7.7	
Torquay (R.) . .	3.64	23	.44	52.5	43.5	89	39.3	48.2	33.9	53.2	5.0	
Torquay (C. C.) .	3.76	23	.48	54.2	45.2	87	40.2	49.3	31.5	54.3	7.7	
Babbacombe . . .	3.86	22	.51	52.8	43.8	88	39.3	49.0	31.8	55.9	7.8	
Sidmouth	2.82	24	.32	53.3	43.3	90	39.0	48.4	31.0	54.7	7.8	
Plymouth	3.21	23	...	...	44.0	91	39.9	49.5	...	...	...
Exeter	2.84	20	.38	55.0	...	...	37.7	47.4	30.0	56.5	5.5
Brampford Speke .	3.05	24	.44	55.0	42.3	90	37.7	47.7	29.0	55.9	7.6	
Cullompton . . .	3.57	22	.41	54.0	42.3	88	37.3	48.3	26.6	55.6	7.7	
Ashburton	7.83	21	.98	51.7	43.1	92	38.6	47.9	31.5	54.4	7.4	
Bridgetown . . .	5.92	25	.73	53.4	43.7	88	38.9	49.7	26.5	55.1	8.2	
Holne Vicarage . .	9.78	26	1.19	...	...	...	...	...	...	...	...

FEBRUARY.

Ilfracombe . . .	3.51	21	1.00	37.0	45.9	92	41.9	50.3	34.8	54.0	6.8
Teignmouth (B.) .	6.22	16	1.34	30.4	43.3	88+	38.0	50.0	29.3	56.4	6.8
Teignmouth (W.) .	5.75	17	1.23	34.0	43.9	91	38.2	51.4	29.9	57.6	6.2
Torquay (R.) . . .	5.15	18	1.10	35.0	42.9	90	37.3	49.4	32.4	54.7	6.9
Torquay (C. C.) .	5.60	18	1.20	33.4	44.4	90	38.3	50.0	29.0	55.3	6.8
Babbacombe . . .	5.68	18	1.21	35.1	43.9	89	37.7	50.6	29.2	57.6	7.1
Sidmouth	4.81	24	.85	31.5	43.7	91	38.9	49.7	28.8	56.4	6.9
Plymouth	4.44	20	...	...	...	95	37.8	50.3	...	...	...
Exeter	7.16	16	1.84	31.0	...	...	38.6	49.7	32.0	65.5	4.5
Brampford Speke .	6.87	18	1.78	29.5	42.3	94	36.5	49.3	28.2	54.8	6.7
Cullompton	6.08	19	1.33	27.6	42.7	91	36.4	49.9	26.0	56.1	6.9
Ashburton	10.10	17	1.87	36.5	43.7	91	37.7	50.1	28.7	56.4	5.9
Bridgetown	7.67	19	1.81	26.7	42.5	91	37.0	51.5	25.4	56.8	6.8
Holne Vicarage . .	12.38	19	2.14	...	...	...	...	...	...	...	...

MARCH.

Ilfracombe . . .	.48	10	.11	49.0	40.9	85	36.7	44.8	27.8	54.0	5.0
Teignmouth (B.) .	1.40	10	.65	49.4	38.7	76+	33.0	46.4	25.0	57.6	4.8
Teignmouth (W.) .	1.42	13	.57	49.4	40.1	...	32.2	47.9	23.1	58.4	4.7
Torquay (R.) . . .	1.29	9	.59	48.0	38.4	75	32.0	45.4	22.7	57.7	5.8
Torquay (C. C.) .	1.35	8	.64	50.0	39.2	...	33.0	44.4	23.9	54.8	4.6
Babbacombe . . .	1.37	10	.62	48.5	39.6	73	31.7	45.8	23.3	55.9	5.2
Sidmouth	1.19	13	.36	49.5	38.0	80	31.5	44.5	22.7	55.7	5.5
Plymouth	1.17	11	...	...	...	84	32.3	46.5	...	...	...
Exeter	1.32	8	.54	49.5	...	...	31.0	45.2	23.0	55.0	3.2
Brampford Speke .	1.30	14	.44	48.8	37.5	81	30.7	45.1	22.5	54.8	5.5
Cullompton	1.53	11	.46	49.5	37.9	78	29.8	45.2	18.0	55.8	5.2
Ashburton	2.71	12	1.26	47.8	39.5	76	31.3	45.4	22.2	58.0	4.7
Bridgetown	1.86	12	.82	49.5	39.2	78	29.5	47.0	18.2	57.5	4.8
Holne Vicarage . .	2.94	13	1.31	...	...	...	...	...	...	...	...

APRIL.

STATIONS.	RAINFALL.			TEMPERATURE IN STAND.								Cloud, 9 a.m. (0-10).
	Total.	Wet Days.	Greatest Fall.	Temperature, 9 a.m. on first day of month.	MEANS.				EXTREMES.			
					Temperature, 9 a.m.	Humidity, 9 a.m.	Minima.	Maxima.	Night Minimum.	Day Maximum.		
	in.		in.	deg.	deg.	%	deg.	deg.	deg.	deg.		
Ifracombe	1.34	9	.47	50.0	49.0	86	43.6	54.0	36.7	62.0	5.3	
Teignmouth (B.) . . .	1.00	8	.41	45.0	48.5	74	41.1	54.3	34.0	58.5	6.4	
Teignmouth (W.) . . .	1.09	11	.38	49.4	49.1	79	40.4	54.8	33.0	59.8	6.0	
Torquay (R.) . . . . .	.75	8	.30	50.5	48.1	78	40.3	54.3	32.4	59.5	7.3
Torquay (C. C.) . . . .	.80	5	.32	46.2	47.7	83	40.7	53.4	33.0	58.8	6.3
Babbacombe . . . . .	.83	11	.34	45.8	47.7	78	39.6	53.9	33.1	58.7	7.0
Sidmouth	1.08	10	.59	47.3	47.6	78	40.1	52.6	32.8	57.6	6.7	
Plymouth . . . . .	.75	9	...	...	...	82	42.2	55.4	...	...	...
Exeter	1.36	8	.52	44.5	...	...	39.3	55.3	32.5	60.0	1.0
Brampford Speke	1.32	8	.69	42.7	48.8	81	38.3	56.2	30.8	61.7	6.3	
Cullompton	1.34	9	.76	45.4	48.5	75	36.8	56.2	28.2	64.2	6.4	
Ashburton	1.66	12	.63	47.7	48.2	78	40.0	54.2	32.6	62.0	6.5	
Bridgetown	1.15	11	.46	44.5	49.0	76	36.5	56.3	27.6	62.0	6.7	
Holne Vicarage	1.73	14	.69	...	...	...	...	...	...	...	...

MAY.

Ifracombe	2.48	14	.72	49.0	51.8	88	47.1	57.4	40.1	69.5	7.5
Teignmouth (B.)	2.02	13	.77	49.4	53.8	71	45.0	59.5	34.4	73.0	7.0
Teignmouth (W.)	1.89	14	.58	49.2	53.9	76	44.3	60.8	33.2	74.6	6.7
Torquay (R.)	2.04	13	.59	49.0	52.5	76	44.2	58.8	34.9	71.6	7.2
Torquay (C. C.)	2.11	13	.59	49.7	53.0	83	44.9	57.7	34.0	69.8	7.2
Babbacombe	2.30	13	.66	48.1	52.6	77	44.0	58.4	36.4	72.8	7.4
Sidmouth	1.56	10	.47	47.9	52.1	79	43.7	57.6	33.5	72.0	7.6
Plymouth	2.62	12	...	...	...	81	45.9	59.5	...	...	...
Exeter	1.12	9	.32	49.5	...	...	44.5	60.7	35.0	71.5	4.5
Brampford Speke	1.38	12	.35	49.0	53.3	79	43.9	60.3	34.8	71.1	7.5
Cullompton	1.49	12	.55	48.5	53.5	76	42.1	60.2	33.0	71.5	7.5
Ashburton	2.34	11	.76	51.5	53.3	78	44.2	59.0	33.9	72.1	...
Bridgetown	3.12	13	1.10	51.6	54.7	73	41.0	60.9	28.0	72.7	6.9
Holne Vicarage	2.56	10	1.12	...	...	...	...	...	...	...	...

JUNE.

Ifracombe	3.27	17	.78	56.3	57.3	84	52.5	62.6	46.8	72.0	6.8
Teignmouth (B.)	3.08	16	.81	55.2	58.2	76	50.8	65.0	42.5	72.9	...
Teignmouth (W.)	3.85	18	.79	54.9	59.3	78	50.5	66.4	42.7	76.0	7.1
Torquay (R.)	2.70	18	.80	55.8	57.3	80	49.4	63.1	42.9	71.6	8.8
Torquay (C. C.)	2.86	18	.70	56.0	57.3	84	50.1	62.9	42.0	71.5	7.6
Babbacombe	3.17	18	.87	56.9	57.8	79	49.5	63.3	41.0	72.8	7.8
Sidmouth	2.58	20	.50	54.3	57.4	79	49.5	62.9	41.9	75.4	8.1
Plymouth	3.07	18	...	...	...	82	51.9	64.6	...	...	...
Exeter	2.18	14	.60	57.3	...	...	47.2	66.8	44.0	75.0	2.0
Brampford Speke	2.02	18	.46	60.3	58.9	78	50.2	65.8	41.5	78.4	7.5
Cullompton	1.93	15	.38	58.8	58.6	74	47.8	66.2	38.0	76.0	7.3
Ashburton	4.24	21	1.73	56.0	57.2	82	49.2	64.1	42.1	73.2	...
Bridgetown	3.80	19	1.20	58.3	60.1	73	47.8	66.3	36.8	74.7	7.0
Holne Vicarage	4.47	19	1.96	...	...	...	...	...	...	...	...

JULY.

STATIONS.	RAINFALL.			TEMPERATURE IN STAND.							Cloud, 9 a.m. (0-10).
	Total.	Wet Days.	Greatest Fall.	Temperature, 9 a.m. on first day of month.	MEANS.			EXTREMES.			
					Temperature, 9 a.m.	Humidity, 9 a.m.	Minima.	Maxima.	Night Minimum.	Day Maximum.	
	in.		in.	deg.	deg.	%	deg.	deg.	deg.	deg.	
Ilfracombe . . .	2.54	24	.52	67.0	59.7	81	52.7	63.2	46.3	71.0	6.5
Teignmouth (B.) .	2.89	18	.75	62.9	59.3	76	53.4	64.6	48.2	72.5	7.5
Teignmouth (W.) .	3.07	22	.72	63.3	60.8	80	51.9	66.8	46.0	75.2	6.9
Torquay (R.) . .	4.74	24	1.61	62.7	58.4	81	52.1	63.3	43.9	72.1	7.3
Torquay (C. C.) .	3.78	20	1.25	62.7	59.4	79	52.4	63.8	46.5	69.8	7.6
Babbacombe . .	4.30	23	1.32	64.8	60.4	79	51.5	65.0	46.0	72.4	7.2
Sidmouth . . .	2.93	25	.40	57.1	58.6	83	52.2	63.0	44.8	70.0	8.7
Plymouth . . .	2.64	23	...	...	...	86	53.9	65.7	...	...	...
Exeter	3.08	16	.46	64.0	...	...	52.1	66.9	47.5	74.0	1.2
Brampford Speke .	4.58	21	1.27	65.3	60.1	79	51.5	65.1	46.0	71.8	7.4
Cullompton . . .	3.55	23	.43	64.3	59.5	75	50.3	65.2	41.8	71.8	7.4
Ashburton . . .	3.75	22	.65	60.0	58.5	85	51.3	65.1	45.4	70.4	7.0
Bridgetown . . .	2.92	24	.63	67.0	61.7	75	51.5	66.7	43.8	72.3	6.8
Holne Vicarage .	3.99	24	.64	...	...	...	...	...	...	...	...

AUGUST.

Ilfracombe . . .	1.58	17	.35	61.0	60.9	84	56.6	64.6	49.6	71.3	6.3
Teignmouth (B.) .	.43	9	.21	59.9	61.9	74	54.6	68.0	48.0	75.3	6.7
Teignmouth (W.) .	.54	12	.16	60.8	63.6	77	53.6	70.1	47.6	77.6	5.4
Torquay (R.) . .	.66	10	.30	59.5	60.9	74	53.7	66.6	49.0	76.6	7.0
Torquay (C. C.) .	.65	9	.34	61.2	61.6	75	53.6	66.4	47.3	75.2	5.5
Babbacombe . .	.75	15	.29	61.3	62.2	76	53.1	67.8	47.1	75.9	7.3
Sidmouth . . .	1.00	20	.24	58.1	61.1	81	53.6	66.1	45.9	73.3	7.9
Plymouth . . .	1.01	12	...	...	...	86	54.3	66.7	...	...	...
Exeter	1.00	8	.54	62.5	...	...	53.2	68.8	46.5	76.5	2.0
Brampford Speke .	1.67	15	.47	60.0	60.5	82	52.6	67.3	44.6	73.7	6.8
Cullompton . . .	1.82	16	.61	59.1	61.5	78	50.6	68.3	39.3	74.8	7.0
Ashburton . . .	1.57	16	.47	62.5	60.7	81	52.8	67.1	47.7	75.5	6.2
Bridgetown . . .	1.38	15	.43	62.3	62.5	76	51.3	69.4	40.1	77.7	6.6
Holne Vicarage .	1.82	18	.49	...	...	...	...	...	...	...	...

SEPTEMBER.

Ilfracombe . . .	3.87	19	.71	58.5	58.5	86	54.8	62.0	49.3	69.0	7.1
Teignmouth (B.) .	4.76	16	1.16	57.4	57.4	82	52.1	63.8	44.2	68.1	7.2
Teignmouth (W.) .	5.72	22	1.14	56.8	58.8	84	51.5	65.5	44.0	70.6	6.5
Torquay (R.) . .	4.57	20	.97	56.5	56.5	87	51.0	62.5	45.0	70.0	7.6
Torquay (C. C.) .	4.56	17	1.00	57.7	57.7	84	51.5	62.2	42.7	68.1	7.7
Babbacombe . .	4.81	19	1.06	56.8	57.4	84	50.9	62.8	44.7	67.4	7.3
Sidmouth . . .	5.52	24	.75	57.3	57.4	85	51.3	62.5	45.1	67.5	8.2
Plymouth . . .	5.10	18	...	...	...	91	51.2	63.1	...	...	...
Exeter	5.96	17	1.46	57.0	...	...	51.2	63.6	41.7	69.0	4.5
Brampford Speke .	5.76	21	1.38	56.5	57.1	86	50.2	62.6	40.0	67.5	7.7
Cullompton . . .	5.12	20	.98	56.8	57.3	85	49.8	64.1	36.3	73.1	7.8
Ashburton . . .	7.64	19	1.90	55.0	56.4	90	50.5	62.6	43.8	68.1	7.2
Bridgetown . . .	6.08	21	1.43	57.6	57.3	85	49.6	64.4	36.1	72.0	5.0
Holne Vicarage .	10.06	20	2.53	...	...	...	...	...	...	...	...

OCTOBER.

STATIONS.	RAINFALL.			TEMPERATURE IN STAND.								Cloud, 9 a.m. (0-10).
	Total.	Wet Days.	Greatest Fall.	Temperature, 9 a.m. on first day of month.	MEANS.				EXTREMES.			
					Temperature, 9 a.m.	Humidity, 9 a.m.	Minima.	Maxima.	Night Minimum.	Day Maximum.		
	in.		in.	deg.	deg.	%	deg.	deg.	deg.	deg.		
Ilfracombe	3.23	17	.72	52.0	54.1	84	50.7	57.3	44.0	62.0	6.0	
Teignmouth (B.) . . .	2.78	12	.86	50.7	51.6	85	47.1	57.4	37.5	61.9	7.3	
Teignmouth (W.) . . .	3.12	15	.86	49.6	52.6	80	46.4	59.1	37.2	64.2	6.4	
Torquay (R.)	2.63	16	.67	49.0	51.3	85	46.5	56.8	40.0	64.0	6.8	
Torquay (C. C.)	2.78	17	.78	49.8	52.2	86	46.3	56.5	...	...	...
Babbacombe	3.03	17	.80	50.8	52.7	83	45.9	57.3	36.1	64.2	6.6	
Sidmouth	2.91	18	.70	49.3	52.1	86	46.1	56.7	36.3	60.8	7.6	
Plymouth	3.12	18	...	...	...	91	45.5	57.6	...	...	...
Exeter	3.54	12	.94	50.3	...	...	45.9	57.1	35.5	61.5	1.5
Brampford Speke	3.92	19	.75	50.0	51.0	90	44.1	56.0	33.5	60.8	7.0	
Cullompton	3.54	20	.64	51.5	51.5	...	43.6	57.1	31.7	63.2	7.0	
Ashburton	5.67	19	1.33	50.0	52.5	86	46.2	57.3	38.8	61.5	6.3	
Bridgetown	4.40	19	1.27	53.8	51.9	82	43.6	58.0	30.9	65.3	7.0	
Holne Vicarage	7.20	20	1.52	...	...	...	...	...	...	...	...

NOVEMBER.

Ilfracombe	5.51	23	.76	51.0	48.0	85	44.4	52.3	35.5	58.0	7.6
Teignmouth (B.)	3.61	21	.59	49.1	44.7	89	40.5	51.8	30.6	56.5	7.1
Teignmouth (W.)	4.05	22	.63	48.2	46.3	92	40.5	53.1	32.1	64.1	6.5
Torquay (R.)	4.19	22	.95	48.0	46.1	86	41.0	51.0	32.4	54.7	7.1
Torquay (C. C.)	4.26	23	.81	49.7	47.3	87	41.6	51.8	...	...	...
Babbacombe	4.54	24	1.03	48.6	46.5	86	40.4	51.9	28.1	57.0	6.9
Sidmouth	3.75	26	.72	48.3	46.2	88	40.9	51.6	30.3	55.9	7.7
Plymouth	4.47	24	...	...	...	92	39.7	52.4	...	...	...
Exeter	3.16	21	.44	49.0	...	...	39.2	50.6	28.0	58.0	3.0
Brampford Speke	3.49	27	.38	48.8	42.5	94	37.0	49.9	26.3	55.6	7.3
Cullompton	4.36	24	.46	47.4	43.6	...	36.8	50.9	23.3	57.6	7.0
Ashburton	6.41	23	1.10	47.5	46.1	94	41.0	51.8	33.7	57.0	6.5
Bridgetown	5.96	23	.82	48.8	45.1	90	38.7	52.4	24.4	58.5	7.1
Holne Vicarage	8.35	26	1.16	...	...	...	...	...	...	...	...

DECEMBER.

Ilfracombe	1.53	15	.58	49.5	45.5	85	43.0	48.7	51.5	54.0	7.0
Teignmouth (B.) . . . .	.48	12	.13	45.0	42.2	86	39.2	47.5	29.1	54.6	7.4
Teignmouth (W.) . . . .	.65	12	.20	45.5	41.6	89	38.6	48.0	28.8	56.6	6.1
Torquay (R.) . . . . .	.57	12	.18	42.0	38.8	84	38.3	46.4	27.8	53.2	7.0
Torquay (C. C.) . . . . .	.50	10	.15	46.2	43.4	88	39.0	47.2	...	...	...
Babbacombe . . . . .	.65	13	.16	44.8	42.1	86	38.7	46.9	30.0	54.0	7.2
Sidmouth . . . . .	.93	16	.27	44.9	42.6	87	38.4	46.3	28.2	55.5	7.8
Plymouth . . . . .	.88	18	...	...	...	91	38.8	47.9	...	...	...
Exeter . . . . .	.92	10	.30	46.2	...	...	37.9	45.2	28.0	54.0	2.0
Brampford Speke	1.25	20	.25	45.2	40.7	90	36.8	46.1	24.9	54.8	7.0
Cullompton	1.67	17	.41	45.0	40.5	...	36.3	46.0	22.2	55.2	7.0
Ashburton	1.74	18	.46	45.7	42.0	91	38.2	46.8	28.3	53.9	7.0
Bridgetown	1.32	19	.35	45.7	41.4	91	37.0	47.4	21.7	54.5	7.0
Holne Vicarage	2.41	19	.59	...	...	...	...	...	...	...	...

THE LITERATURE OF KENT'S CAVERN.

PART V.

EDITED BY W. PENGELLY, F.R.S., F.G.S., ETC.

(Read at Newton Abbot, July 30th, 1884.)

So far as I am aware, *The Literature of Kent's Cavern*, Parts I. to IV., the last of which was printed in 1878 (*Trans. Devon. Assoc.* ii. 469-522, iii. 191-482, iv. 467-490, and x. 141-181), include all that had been written before 28th March, 1865, when a new chapter in the History of the Cavern may be said to have begun, as the outcome of the following facts.

On 4th November, 1863, when writing Sir C. Lyell, I expressed the opinion that a thorough exploration of the Cavern would absorb 5 years and £200 per annum. Writing him again on 2nd April, 1864, I suggested that an application should be made to the British Association, during the meeting to be held at Bath in the following September, for the appointment of a Committee, with a grant of money, to explore the Cavern; and it was decided that I should take the necessary steps in the matter.

The proposal was accordingly laid before the Committee of the Geological Section, where it was cordially received. A Committee—consisting of Sir C. Lyell, Mr. J. Evans, Mr. (now Sir) J. Lubbock, Professor Phillips, Mr. E. Vivian, and myself (Hon. Secretary and Reporter)—was appointed, with £100 placed at their disposal. Mr. G. Busk was added to the Committee in 1866, Mr. (now Professor) W. Boyd Dawkins in 1868, Mr. W. Ayshford Sanford in 1869, and Mr. J. E. Lee in 1873.

The late Sir L. Palk (afterward Lord Haldon), the proprietor, placed the Cavern entirely under the control of the Committee during the investigation; the work was begun on 28th March, 1865, and continued without intermission to 19th June, 1880—the Committee being annually re-appointed with fresh grants of money, amounting in the aggregate to £1,900, to which £63 were added from various private sources; and Annual Reports, presented to the Association through the Geological Section, were published in the yearly volumes of that body, from 1865 to 1880 inclusive.

The time spent on the work exceeded my estimate, partly because it was found undesirable to employ so large a staff of workmen as I had at first contemplated, and also because of the discovery of several large unsuspected branches of the Cavern. The discovery just mentioned necessarily caused the expenditure to be considerably above my estimate; indeed, to be almost twice the amount.

The Present Part (V.) of *The Literature of the Cavern* consists of the sixteen Reports just mentioned, which have not only been revised throughout, but, being my own productions, I have felt at liberty to abridge them where it could be done without injury, while a few requisite additions have been made here and there—the added matter being in all cases placed within square brackets.

FIRST REPORT. Read at Birmingham, September, 1865. (See *Rep. Brit. Assoc.* 1865, pp. 16–25.)

The celebrated Kent's Cavern, or Kent's Hole, about a mile due east from Torquay harbour, occupies a small, wooded, limestone hill on the western side of a valley terminating, about half a mile southward, on the northern shore of Torbay.

The hills immediately surrounding the district consist of Limestone, Greenstone, Clay-slate, and a reddish Grit or compact Sandstone. The last two are traversed by veins of quartz; and, with the possible exception of the Greenstone, they all belong to the Devonian System. Indeed, the entire Torquay peninsula is exclusively made up of rocks of that age.

According to tradition there were formerly four or five Entrances to the Cavern, of which only two were generally known, the others being, it was said, merely narrow apertures or slits, through which, until they were blocked up from within, the initiated were wont to enter clandestinely. [It is now known, however, that the traditional "narrow aper-

tures or slits" were purely mythical.] The two well-known Entrances are about 54 feet apart, and in the face of one and the same low, vertical, natural cliff, running nearly north and south, on the eastern side of the hill. The Northern Entrance is rudely triangular, about 6 feet high, and 8 feet wide at the base, which, however, is incoherent deposit, not a bed of coherent rock *in situ*. This base, according to an aneroid barometer, is 57·5 feet above a neighbouring "bench mark," which Sir Henry James states is 131·6 feet above the level of mean tide at Liverpool; hence the base of the Northern Entrance is about 189 feet above mean-tide level. The Southern Entrance is a natural and tolerably symmetrical arch, 6 feet high, and 9 feet wide at the base. Its form is partly due to a gentle curvature of the strata, and partly to the actual removal by natural causes of portions of the Limestone beds. The base of this opening is about 4 feet lower than that of the Northern Entrance.

From the time of the researches and discoveries which, in 1824, rendered the Cavern palæontologically famous, to the beginning of the exploration under the auspices of the British Association in March, 1865, the Southern Entrance had been artificially blocked up to exclude stray animals and other unwelcome visitors.

The Cavern has been known from time immemorial, even tradition failing to reach back to the date of its discovery; but it did not attract the attention of scientific enquirers until 1824, when Mr. Northmore of Cleve, near Exeter, visited it with the double object, as he stated, "of discovering organic remains, and of ascertaining the existence of a temple of Mithras," and he declared himself happy to say that he was "successful in both objects." (See *Trans. Devon. Assoc.* ii. 479-495.) He was speedily followed by Mr. [afterwards Sir] W. C. Trevelyan, who is said to have been "the first that obtained any results of value to science. (*Ibid.* iii. 207, vi. 52, x. 145.) The Rev. J. Mac Enery, whose name must be for ever associated with the Cavern, first visited it in the summer of 1825. He was at that time quite inexperienced in cavern researches, for he states that the party he had been induced to accompany was a large one, and that on entering he was the last of the train, for he could not divest himself of certain indefinable sensations, it being his first visit to a scene of this nature. (*Ibid.* iii. 208.) The visit was a memorable one; for, separating himself from his companions, and

devoting himself to what he conjectured to be a favourable spot, he found several teeth and bones; and he thus describes his feelings on the occasion: "They were the first fossil teeth I had ever seen, and as I laid my hands on them, relics of extinct races and witnesses of an order of things which passed away with them, I shrank back involuntarily. Though not insensible to the excitement attending new discoveries, I am not ashamed to own, that in the presence of these remains I felt more of awe than joy" (*Ibid.* 210). He at once communicated his discovery to the Rev. Dr. Buckland, and for some years, from time to time, followed up his good fortune with great energy. His memoranda contain no mention of a visit after 14th August, 1829.

Though he at one time intended to publish a narrative of his researches, and had made arrangements for the necessary illustrations, the intention was unfortunately abandoned. On his decease it was feared that his Manuscripts had been destroyed or lost; but they passed ultimately into the hands of Mr. Vivian of Torquay, who in 1859 published a compilation from them. (See *Cavern Researches*. Simpkin, Marshall, and Co.) [The MSS. finally became the property of the Torquay Natural History Society, and in 1869 I printed them in their entirety. (*Trans. Devon. Assoc.* iii. 196-482.)]

In 1840 Mr. R. A. C. Austen [now Godwin-Austen] read to the Geological Society of London, a paper on the *Bone Caves of Devonshire*, when he described the results of his investigations in Kent's Hole. (*Ibid.* ii. 496-501.)

In 1846, the Torquay Natural History Society appointed a Committee consisting of Dr. Battersby, Mr. Pengelly, and Mr. Vivian, to conduct an exploration of a small portion of the Cavern. Though their object was mainly to obtain specimens for the Society's Museum, very careful attention was given to the positions and associations of all the articles found. A Report was presented by the Committee (*Ibid.* x. 162-6), and a paper embodying the results of the investigation, prepared by Mr. Vivian, was read to the Geological Society of London and to the British Association in 1847. (See *Quart. Journ. Geol. Soc.* iii. 353, and *Rep. Brit. Assoc.* 1847. p. 73.)

Though it may be doubted whether any of the foregoing explorations were conducted with that strict observance of method which is now held to be necessary, all the explorers are unanimous in stating that they found flint "implements" mixed up with the remains of extinct animals.

In 1858, the results of the systematic and careful exploration of Brixham Cavern, on the opposite shore of Torbay, induced the scientific world to suspect that the alleged discoveries which, from time to time during a quarter of a century, had been reported from Kent's Hole, might, after all, be entitled to a place among the verities of science; and from that time various proposals for further investigations have been made. As is well known, these suggestions took a definite form at the last Meeting of this Association [Bath, 1864], when a liberal grant of money was made, and a Committee appointed for the purpose of further explorations. It is the object of this communication to state what, up to this time, the results have been, so far as they are at present determined.

The Committee have great pleasure in stating that, in reply to their application for permission to make the proposed investigation, the proprietor, Sir L. Palk, Bart., M.P. [afterwards Lord Haldon], assured them most promptly that it would give him great pleasure to place every facility in their hands. He placed the Cavern in their exclusive custody, and suggested most satisfactory arrangements for the ultimate disposal of such objects of interest as might be found.

Though large portions of the deposits were broken up by Mr. Mac Enery, as well as by his contemporaries and successors, there is still within the Cavern a large amount of virgin ground. The Committee, however, were desirous of beginning their work in an area not only containing deposits intact, but presenting no considerable difficulties. After a visit of inspection it was decided to undertake the exploration of the "Great Chamber" into which the Southern Entrance opens immediately; the mode of investigation was laid down; trustworthy and intelligent workmen were engaged—Mr. Charles Keeping, brother of the well-known fossil collector, being the foreman; and the work—consigned to the superintendence of the two resident members of the Committee, Mr. Vivian and Mr. Pengelly, (the Honorary Secretary)—was commenced on 28th of March 1865.

Immediately outside the Cave lay a considerable talus of earth and stones, of which at least the upper portion was believed to have been thrown out by Mr. Mac Enery, who conducted his researches through the Northern Entrance. In cutting through this mass in order to reach and make available the Entrance selected by the Committee for their operations, the material was very carefully examined, partly

for the purpose of detecting any objects of interest it might contain, and partly as an initiatory exercise for the workmen, who were without experience in Cavern work.

The Cavern seems to be in no part subject to any considerable amount of drip, and no portion of it is drier than the Great Chamber. Since the commencement of the work unusually heavy rains have fallen in the district, but water has entered through the roof at very few points only, and in no instance sufficient to produce discomfort or inconvenience. [Subsequent experience proved that the amount of drip in other parts of the Cavern was at first much underrated. The work having only extended from the end of March to the end of August, there had been no experience of the results of the winter rainfall.]

The following is the succession of deposits, in descending order, which the Great Chamber contained:—

1st. Huge blocks of limestone which had manifestly fallen from the roof. Many of them required blasting to effect their removal; and in several instances it was necessary to blast even the masses into which they were by this means divided. One of the blocks measured 11 feet long, 5·5 feet broad, and 2·5 feet thick; hence it contained upwards of 100 cubic feet, and must have weighed fully 7 tons. In some cases two or three of them lay one on another, and, in a few instances, were firmly cemented together by a separate cake of stalagmite between each pair; whilst others lay unconformably with considerable interspaces. Occasionally, what appeared to be a boss or dome of stalagmite proved to be a block, or two or three small blocks, of limestone invested on all sides with a stalagmitic sheet. Certain masses, lying at some distance from a drop, were without even a trace of stalagmite.

2nd. Beneath these limestone blocks there was a layer of mould of an almost black colour, varying from a few inches to upwards of a foot in depth [and termed "The Black Mould."]

3rd. Underneath this was a Stalagmitic Floor, containing in places comparatively small fragments of limestone so firmly cemented with carbonate of lime as occasionally to require blasting, and rarely less, but not unfrequently much more, than a foot thick. It was everywhere firmly attached to the walls, and it occasionally extended completely across the Chamber, but not unfrequently the centre was alto-

gether destitute of this Floor—in some instances because no drip fell there, in others because it was intercepted by an overlying limestone block.

[From its prevalent character this received the name of the "Granular Stalagmite," or the "Granular Stalagmitic Floor," to distinguish it from a sheet of the same material, but of higher antiquity and a different texture.]

4th. The Granular Stalagmitic Floor was succeeded by a red loam, termed the "Cave Earth," containing a large number of limestone fragments, from bits not larger than sixpences to masses but little smaller than those lying on the surface. They lay at all angles without anything like symmetrical arrangement. In fact, the entire deposit was without any approach to stratification. Many of the stones were more or less encrusted with calcareous matter, and not unfrequently Cave-earth, stones, and splinters of bone were cemented with the same substance into a very tough concrete. The presence of the calcareous drip was more or less traceable everywhere. The Cave-earth has hitherto been excavated to the depth of only 4 feet below the bottom of the Granular Stalagmite. How far it extends below this, or what may be beneath is at present unknown. Where it was not covered with the Stalagmite the Black Mould lay immediately on it, but the line of junction was everywhere sharply defined, and no instance of commingling presented itself.

Since the large masses of limestone occurred at all levels in the Cave-earth as well as everywhere above it, it is obvious that whatever may be the cause to which their fall is attributable, they cannot be referred to any one and the same period. They fell from time to time throughout the accumulation of the Cave-earth, they continued to fall while the Granular Stalagmitic Floor was in process of formation, as well as during the introduction of the Black Mould, and they were amongst the most recent phenomena the Cavern presented. And even of those lying on the surface, there was conclusive evidence that in some cases a considerable interval of time must have elapsed between the fall of two blocks lying one on the other—an interval sufficiently great for the formation of the cake of Stalagmite between them, sometimes fully 6 inches thick. There can be little doubt that some of them fell very recently, even when measured by human standards.

It is by no means easy to determine the cause which threw

them down. To call in the aid of convulsion seems undesirable, since it would be necessary to do so very frequently. Moreover, it may be doubted whether anything short of a violent earthquake would be equal to the effect. Though the roof of the Great Chamber is of very great span and entirely unsupported, and though it presents appearances not calculated to inspire confidence, the violent concussions produced by the frequent blastings already mentioned—blastings which not unfrequently threw masses of limestone weighing upwards of a ton to a distance of several feet—have never been known to bring down even a splinter.

The fall of the blocks has sometimes been attributed to changes of dimensions in the roof, arising from changes of temperature; but the fact that the Cavern temperature, even near the external entrances, is all but constant throughout the year seems fatal to this hypothesis. [Thermometric observations show that from even short distances from the Entrances, throughout the entire interior, the temperature never undergoes the least change. (See *Trans. Devon. Assoc.* vii. 312–319, and xiii. 398–401.)]

The masses of limestone lying on the surface were a sufficient guarantee that the deposits beneath them remained intact, at least so far as man was concerned. There can be no doubt that they were at once a proof and the cause of the soil beneath them being undisturbed by the earlier explorers. A portion of the Cavern so accessible as the Great Chamber would not have been spared by Mr. Mac Enery except on account of some great difficulty or discouragement; and in fact he states that the fallen masses completely foiled him in his attempts to make explorations in it, excepting in one branch some distance south of the area selected by the Committee. (See *Trans. Devon. Assoc.* iii. 232.) Their own characters, moreover, rendered it absolutely certain that the deposits had never been violated.

The following is the method of exploration observed from the commencement, and which, it is believed, affords a simple and correct method of determining the exact position of every object which has been found.

1st. The Black Mould accessible between the masses of limestone on the surface was carefully examined and removed.

2nd. The limestone blocks occupying the surface of the deposits were blasted and otherwise broken up, and taken out of the Cavern.

3rd. A line, termed the "Datum line," was stretched

horizontally from a fixed point at the Entrance to another at the back of the Chamber, and its direction ascertained by compass.

4th. Lines, one foot apart, were drawn at right angles to the datum line, and therefore parallel to one another, across the Great Chamber, so as to divide the surface of the deposit into belts termed "Parallels."

5th. In each Parallel the Black Mould which the limestone masses had covered was first examined and removed, and then the Granular Stalagmite, so as to lay bare the surface of the Cave-earth.

6th. Horizontal lines, a foot apart, were then drawn from side to side across the vertical face of the Section, so as to divide each Parallel into four layers termed "Levels," each a foot deep.

Finally, each Level was divided into lengths called "Yards," each 3 feet long, and measured right and left from the datum line as an axis of abscissæ.

In fine, the Cave-earth was excavated in vertical slices or Parallels 4 feet high, 1 foot thick, and as long as the Chamber was broad, where this breadth did not exceed 30 feet. Each Parallel was taken out in Levels 1 foot high, and each Level in horizontal prisms 3 feet long and a foot square in the section, so that each contained 3 cubic feet of deposit.

This material, after being carefully examined *in situ* in candlelight, was taken to the door and re-examined in daylight, after which it was at once removed without the Cavern. A box was appropriated to each Yard exclusively, and in it were placed all the objects of interest which the prism or Yard yielded. The boxes, each having a label containing the data necessary for defining the situation of its contents, were daily sent to the Honorary Secretary of the Committee, by whom the specimens were at once cleaned and packed in fresh boxes. The labels were numbered and packed with the specimens to which they belonged respectively, and a record of the day's work was entered in a journal.

The same method was followed in the examination of the Black Mould, and also of the Granular Stalagmite, with the single exception that in these cases the Parallels were not divided into Levels and Yards.

With very rare exceptions the Cavern has been visited daily by one, and frequently by both, of the Superintendents; and Monthly Reports of Progress have been regularly forwarded to Sir Charles Lyell, Chairman of the Committee.

[The course sketched in the eleven immediately preceding paragraphs was followed with very rare and slight occasional exceptions to the close of the work in 1880.]

Though it would be premature to attempt anything like an exhaustive list, it may be of interest to furnish a brief and general account of the objects which have been found.

Of the articles met with in the Black Mould, those occurring *between* the fallen masses of limestone have been kept distinct from such as have been detected *beneath* them. Such a division, however, was not rendered necessary by the characters of the objects themselves, and will not be attended to on the present occasion. In this category also may be placed the greater number of the specimens found in the talus outside the Cavern. The collection was of a varied miscellaneous nature, consisting of Stones of various kinds, Human Industrial Remains, Charred wood, Bones of various Animals, Shells of Molluscs, and Shells of Hazel nuts. It passed from the Rabbit's nest lined with clean, dry fur, and containing a couple of fresh green ivy leaves back to the age of Bronze Implements, and probably represented at least two thousand years.

The Stones were in most cases well-rounded, and at least some of them, being distinctly lithodomized, were from the sea-shore. They consisted of Limestone, Quartz, red Grit, Greenstone, and Flint, all, except the last, derivable from the rocks of the immediate district, and probably obtained from the neighbouring sea-beaches, where the Flints were perhaps also found; for though deposits containing Flint do not occur within four or five miles of the Cavern, it is well known that such pebbles are met with on all the existing beaches, as well as the Raised beaches, fringing the coast of Devon, many of them at great distances from any known accumulation of Flints *in situ*. The rounded stones were extremely numerous in the Black Mould, and were no doubt selected and taken to the Cavern, but for what purpose it may not be easy to determine.

There were also several pieces of hard greenish Grit, of an elongated form, and probably used as Whetstones.

Pieces of Slate, most of them angular, were also numerous, and were probably fragments of articles fashioned by man, as portions of curvilinear plates were occasionally met with. Mr. Mac Enery, who mentioned such plates, supposed them to have been used as covers for earthenware vessels. (*Trans. Devon. Assoc.* iii. 219.)

The undoubted Human Industrial Remains consisted of articles in Bronze and in Bone, Pottery, Spindle-whorls, and Flint-flakes.

The Bronze articles were a Fibula, found in the talus outside the Cavern, the bowl and part of the stem of a Spoon, a socketed Spear-head, a fragment of a socketed Celt, two or Rings, one coil of a helical Spring (?), a Pin about 3·75 inches long and an object in form of a horse-shoe, but not more than an inch long.

In this connexion a lump of smelted copper may be mentioned. A mass probably similar is recorded by Mr. Mac Enery as having been analyzed by "Mr. Philips and found to be pure virgin ore." (*Ibid.* 220.)

The Pottery, excepting one small piece undoubtedly Samian, was extremely coarse, and in most cases unglazed. A large number of fragments were found, but nothing approaching a perfect vessel. They were generally ornamented, and from the different patterns, as well as from other facts, it may be concluded that they represented a considerable number of utensils. On the inner surface of one piece there was a firm admixture of clay and bits of charcoal, suggesting that it was a portion, perhaps, of a vessel in which things had been burnt. Much of the pottery is believed to be of Roman age.

The objects fashioned in Bone were a Comb resembling in size and outline a common Shoe-lifter or Shoe-horn, having the teeth cut in the broad end; two fragments apparently of similar Combs, one of them bearing traces of ornamentation; a Spoon (?) neatly formed of part of a rib, and about 6 inches long and 9 inches broad; a Chisel, about 2·6 inches long, and at its broad or cutting end 4 inch wide; a Wedge (?) fashioned somewhat rudely out of a portion of horn or antler; and the Handle of some tool, about 3 inches long. [Mr. Mac Enery appears to have found a Comb similar to that mentioned above. *Ibid.* 219.]

The Spindle-whorls were formed of different materials, such as Devonian Grit, Triassic Sandstone—both occurring in the neighbourhood—coarse greenish Schist, and "Kimmeridge Coal"—neither of which is found in the district. They were of different dimensions, and while some were well finished, others were so roughly made as to make it safer, perhaps, to speak of them as "holed stones" simply. With them may be mentioned a large bead apparently of Amber, and a small perforated piece of limestone, not improbably the work of some rock-boring mollusc.

The Flint flakes were four in number, two of dark and two

of white Flint. The whiteness, however, was more or less superficial, the centre of the stone being a dark grey.

The Bones, which were very numerous, were generally discoloured, and had lost a considerable portion of their weight. Among them were relics of Pig, Deer, Sheep, Fox, Wolf (?) or Dog (?), Bat, Hare, Rabbit, &c., with smaller Rodents, Birds, and Fish. Some of them appeared to have been exposed to the action of fire.

The Shells of Molluscs included those of Terrestrial and Marine genera. Snails, of various species, were the principal Terrestrial kinds, the larger forms being the more prevalent. They occurred in all stages of growth, and had probably established a colony in the Cavern.

Among the Marine genera were Oyster, Cockle, Mussel, Pecten, Solen, Limpet, Whelk, and the internal Shell of Cuttle-fish (*Sepia officinalis*). From the un rubbed condition of the last, it was probably not found cast ashore on the beach, but taken directly from the Cephalopod to which it belonged.

The Shells of Hazel nuts were no doubt obtained from the wood in which the Cavern is situated, and probably carried in by small animals whose bones, like the shells, were often found under the blocks of limestone. Many of the shells were perforated at one end.

[The objects found in the Black Mould were not unlikely to include Bones and Flint implements and flakes found by the early explorers in the subjacent deposits and either lost or cast aside by them, as they were certainly very regardless of many of their "finds" or negligent in preserving them.]

The workmen broke carefully the Granular Stalagmitic Floor into small fragments in order to detect any objects embedded in it. The search, though not very productive, was rewarded by the detection of Charred wood, Marine and Land Shells, and bones of various Mammals, including some extinct species.

The only differences hitherto noted in the four successive Foot-levels in which, as already stated, the Cave-earth was excavated were simply that the first or uppermost was the poorest, and the third, perhaps, the richest in osseous remains; and that the lowest three Levels contained a large amount of comminuted bone, of which there were few instances in the first Level. In other respects the Levels were the same—the same in the materials forming their staple; in the occurrence of various kind of pebbles, which differed from those in the

Black Mould only in being less numerous; in the presence of bones in the same condition and representing the same species of Mammals; and in yielding Flint implements of the same types. It will not be necessary therefore to describe each Level separately or in detail.

The bones found below the Granular Stalagmite were heavier than those met with above it. This distinction was so well marked and so constant as to be characteristic. It would be easy to assign them to their respective deposits by their specific weights alone. Most of those from the Cave-earth were but little discoloured; indeed, some of them were of a chalk-like whiteness. A few, however, here and there, had undergone a considerable amount of discoloration, a consequence probably, and also a proof, of a greater degree of exposure before their inhumation. On most of the discoloured specimens certain lines and patches of lighter colour not unfrequently presented themselves, which may be likened to such as are sometimes left by mosses or lichens on objects on which they have grown.

A large number of bones, teeth, jaws, and antlers were scored with teeth marks, not improbably the work of different kinds of animals; some of the long bones were split longitudinally; and of those found beneath the large fallen masses of limestone some were crushed, thus attesting the fact that the deposit on which they lay, and on which the blocks had fallen, was of a compact character and capable of a firm resistance.

The comminuted bone already spoken of was commonly converted, in union with Cave-earth and stones, into a firm concrete. Not unfrequently, however, it occupied the cavities of some of the larger bones. It sometimes occurred mixed with a cream-coloured substance of a low specific gravity, and occasionally in the form of small detached lumps—the whole believed to be of fæcal origin.

In washing the bones it was frequently found impossible to remove entirely the earthy matter. A thin film, partially at least investing them, defied the brush and water. On drying, however, this occasionally scaled off, and proved to be a paste or paint composed of Cave-earth and carbonate of lime, the latter derived no doubt from drip from the roof.

Large portions of the osseous remains occurred as mere splinters. Teeth were extremely numerous, and represented Bear, Lion, Hyæna, Fox, Horse, Ox, several species of Deer, Rhinoceros, and Mammoth. Remains of Hyæna were probably the most abundant, after which came those of

Rhinoceros, and Horse. The relics of Mammoth included molar teeth and tusks of very young individuals.

It has already been stated that Flint, more correctly Flint and Chert, implements occurred everywhere in the Cave-earth, mixed up with the remains of extinct Mammals. Several were found in the presence of, and some by, the Superintendents. Like the bones they were least abundant in the uppermost Foot-level. A total of nearly thirty were dug out, without reckoning doubtful specimens and mere chips. Of the Flints, properly so called, some were of a dark, and others of a light colour, while a third group were almost white and had a porcellaneous aspect. With the exception of three, they were flat on one side and more or less carinated on the other. Some of them were fragments only, others were found broken but with the parts lying in contact, while others were taken out perfect. Some of the broken white specimens had a dark-coloured central Core.

The excepted three tools were of Chert, and worked on both faces. No. 17 (the number being that of the "find" of which the tool was one specimen), found 13th April, 1865, in the third Foot-level, was ovoid in outline, worked to an edge round the entire perimeter, 4·5 inches long, 3·25 inches in greatest width, and ·75 in greatest thickness.

No. 56, found in the second Foot-level, on 9th May, 1865, was about 4·75 inches long, 2·5 inches in greatest width, tapered to a point at one end and to a width of no more than ·75 inch at the other, was slightly falciform in outline, and the concave margin thinner than the other. The extremity of the pointed end was unfortunately broken off after the tool was exhumed. [This specimen is figured in Evans's *Ancient Stone Implements*, ed. 1872, fig. 395, p. 454.]

No. 286, found 16th June, 1865, in the fourth, or lowest, Foot-level, was the most elaborately finished implement of the series. It was lighter in colour, and somewhat smaller than the preceding two, the dimensions being 3·5 inches long, 2·5 in greatest breadth, and ·75 in greatest thickness. In outline it belonged to the same group as No. 17. [It has been figured by Mr. Evans. *Ibid*, fig 387, p. 447].

Without entering at present on the consideration of all the bearings of the facts produced, the Committee feel at liberty to express their conviction that it is totally impossible to doubt either the human origin of the "implements" or their inosculation, in undisturbed soil, with the remains of the Mammoth, Cave Bear, and their extinct contemporaries.

Nor are these the only indications of human existence found in the Cave-earth. Several small pieces of burnt bone have been met with in it; some of them loose and unattached, others incorporated in concrete formed of Cave-earth, stones, and comminuted bone.

Mention has already been made of the occurrence in the Cave-earth of rounded stones not derivable from the Cavern hill. It seems probable that, at least, some of them were selected and taken there by man, though it may not be easy, perhaps, to determine in all cases for what purpose.

But waiving this, there were two stones which must not be hastily dismissed. The first, No. 94, found on 17th May, 1865, in the first Foot-level, was a piece of purplish-grey grit, undoubtedly portion of a Whetstone. It stood in a vertical position in a small cavity in the northern wall of the Great Chamber. The Cave-earth in which it was found was covered with a thick compact mass of Granular Stalagmite, containing fragments of limestone firmly cemented, and fully eight feet thick. The Superintendents, having examined the spot with great care, were perfectly satisfied that there was no hole or passage, vertical or lateral, through which the Stone could have slipped, or been thrust, into the cavity after the deposition of the Cave-earth.

The second stone, No. 597, found 29th August, 1865, in the second Foot-level, over which lay an enormous block of limestone, but no Stalagmite, was a Hammer-Stone, in the form of a flattened spheroid, of coarse, hard red sandstone. Its equatorial diameter measured 2.75 inches, and its polar 1.75 inch. It appeared to have been held between the finger and thumb applied at its poles, while objects were broken by blows from all parts of its equatorial circumference. [It is figured by Mr. Evans, *Ibid*, fig. 402, p. 457.]

In addition to the pleasure which always attends scientific discovery, the Committee have had the gratification of confirming most of the statements of their predecessors. Any differences observable between the statements now made and those of the earlier investigators arise from defective, not conflicting, evidence. For example, the Committee have not yet been so fortunate as to find remains of *Machairodus latidens*, mentioned and figured by Mr. Mac Enery (*Cavern Researches*, Mr. Vivian's 8vo. ed., p. 32 and Plate F), nor of *Hippopotamus major*, alluded to by Professor Owen (*Brit. Foss. Mam. and Birds*, 1846, p. 410; or *Trans. Devon. Assoc.* ii. 514) as occurring in the Cavern; nor have they found

anything calculated to discredit the statements referred to. [See on Hippopotamus, *Trans. Devon. Assoc.* iii. 485.]

Again, so far as their researches have gone, the Committee have not, like Mr. Godwin-Austen, found bones of man mixed up in undisturbed soil, with those of extinct animals. (See *Trans. Geol. Soc.*, 2nd Series, vi. 444-6, or *Trans. Devon. Assoc.* ii. 502.) It will be seen, however, that there is no *a priori* improbability in the statements on this point by the distinguished geologist just mentioned; and the Committee may remind such as may be disposed to attach importance to the fact that Men's bones are not forthcoming as readily as their implements that in the Black Mould the only indications of Man's existence were remnants of his handiwork. Pottery, as well as implements and ornaments in bone, metal, and stone, the remnants of his fires and the relics of his feasts were numerous, and betokened the lapse of at least two millenniums; but here, as well as in the older deposit below, the Committee have met with no vestige of his osseous system [Human bones were subsequently found in the Black Mould. See *Fifth Report*, 1869, below].

In conclusion, the Committee would observe that the value of their labours is not to be measured by the discoveries they have made. They have not only disinterred a valuable body of fact, but, with it, a confirmation of the concurrent statements of Mac Enery, Godwin-Austen, and the Committee of the Torquay Natural History Society; and have thereby more than doubled the amount of trustworthy evidence they have themselves produced.

SECOND REPORT. Read at Nottingham, August, 1866. (See *Rep. Brit. Assoc.* 1866, pp. 1-11.)

During the twelve months which have elapsed since the First Report was presented, the Committee have carried on their labours without interruption, the Superintendents have continued to visit the Cavern daily, the original rigorous methods of excavation and examination have been uniformly followed, the results of each day's labour have been carefully registered, and at the commencement of every month a Report of Progress has been forwarded to Sir Charles Lyell, Chairman of the Committee.

The Great Chamber has been completely explored to the depth of 4 feet below the Granular Stalagmite. It measures about 62 feet from east to west, and something more than 30 from north to south. The limestone floor has been reached.

in several places, but elsewhere the deposits descend in fissures to probably considerable depths, and there is reason to believe that beneath the limestone there are extensive undervaultings.

In the inner or back wall of the Chamber, almost due west (magnetic) from the Southern Entrance, the workmen laid open the mouth of a Gallery, about 16 feet wide and extending westward for a distance of 29 feet, where it suddenly terminated in a mere slit in the limestone rock. This, termed "The Gallery," has also been excavated in the same manner and to the same depth as the Great Chamber.

A comparatively narrow passage leads out of the Chamber northwards, and must be traversed in proceeding, within the Cavern, from one of the external Entrances to the other. Mr. Mac Enery termed it the "Passage of Urns" on account of the large amount of broken pottery which he found there in the Black Mould. Since the completion of the exploration of the Gallery, the workmen have been occupied in excavating this passage, a work now almost completed.

All the investigations by the Committee have been carried on in virgin ground. No traces of the earlier researches have hitherto been encountered, the deposits being everywhere indubitably intact.

Several blocks of limestone overlying the Black Mould were met with in the Great Chamber and the Passage of Urns. Some of them were of great size, and one greatly surpassed the largest of those mentioned in the First Report. It measured 19·5 feet long, 9 feet broad, and 2·5 feet thick, or upwards of 430 cubic feet; so that its weight must have exceeded 30 tons. In order to the removal of this huge mass, it was necessary to blast it five times, each blast being very successful.

From their characters and positions, as well as from the condition of the roof, it was obvious that, from time to time, the blocks were severed naturally from the limestone strata, perhaps by the action of acidulated water along planes of jointage, such planes being prevalent and well defined in the Devonian rocks of the district generally. No such masses were found on the floor of the Gallery.

The Black Mould was found everywhere both in the Chamber and in the Passage of Urns; but not in the Gallery, except quite at the entrance, where there was only a mere trace. It continued to yield a large series of such articles as were mentioned in the First Report, few of them requiring to be particularized. The most interesting additions

to the collection from this deposit were a series of Spindle-whorls, a Polishing-stone, and a portion of a cake of Smelted Copper.

The Whorls were six in number, and, unlike any of those mentioned in the First Report, were all formed of Slate. Four of them were highly finished, and two somewhat elaborately ornamented, but in different styles or patterns. No two of them were of the same size. The ornamented two were found lying together. Mr. Franks, Keeper of British and Medieval Antiquities, &c., British Museum, to whom they were submitted, stated that "the pattern on one of them resembled that on British Pottery."

The Polishing Stone (No. 958, found 22 November, 1865, under a large block of limestone,) was a quadrantal fragment of an oblate spheroidal pebble of fine-grained Quartzite, probably derived, directly or indirectly, from the famous "Pebble-bed" occurring in the Triassic cliff immediately west of Budleigh Salterton, about thirteen miles north-easterly from the Cavern. One of the flattened or polar surfaces, and also one of those at right angles to it, formed by the fracture of the stone, had undergone a considerable amount of artificial polish, as if they had been used in grinding, sharpening, or polishing.

The piece of Copper differed from that mentioned in the First Report only in being smaller.

Some of the pottery found recently was so rotten as scarcely to bear handling, and when placed in water it was resolved into a coarse mud.

It was stated in the Report, sent in last year, that in a few instances the Floor of Granular Stalagmite did not extend quite across the Great Chamber. These gaps entirely ceased at about 42 feet from the external Entrance, so that in the innermost 20 feet of the Chamber, as well as throughout the entire Gallery, the Stalagmite occurred everywhere in unbroken continuity. Its level, however, instead of being uniformly the same, was, on the southern side of the Chamber, invariably somewhat lower than on the northern side. In other words, immediately in front, or east, of the Gallery, it suddenly sank below the general level which it attained elsewhere; but was, nevertheless, perfectly continuous with that which covered the other parts of the Chamber, without any indication of a line of fracture or severance. The Gallery possessed two such Floors, or, as they were termed by way of distinction, a "Floor" and a "Ceiling." The former, or lowermost, like that elsewhere, rested immediately on the

Cave-earth, and towards its base became gradually a strong concrete. It varied from 3 inches to upwards of 2 feet in thickness, and was strictly a continuation of that part of the Floor of the Chamber of which it was the immediate and continuous prolongation. The Ceiling, or uppermost Floor, was of greater thickness. It extended from wall to wall across the Gallery without further support than that furnished by its own inherent cohesion.

Immediately above the Ceiling there was in the limestone rock a considerable Alcove. This branch of the Cavern, therefore, was divided into three stories or flats—that below the Floor, occupied with Cave-earth; that between the Floor and Ceiling, entirely unoccupied; and that above the Ceiling, also without deposit of any kind.

The nether surface of the Ceiling was of a beautifully stainless cream-colour, and sent down a profusion of small stalactites. When first disclosed, the Ceiling was supposed to be a stratum of limestone *in situ*, completely invested with a mere film of stalagmite. In order to determine its true character, several holes were bored through it, when it was found to be exclusively Stalagmite throughout—Granular and comparatively soft in the upper part, but highly Crystalline towards the base.

The origin of this mass was at first not a little puzzling, for while on the one hand it seemed necessary to suppose that it was formed on a basis, either of limestone *in situ* or of detrital matter mechanically accumulated; on the other, it was difficult to understand how this basis could have been removed so completely as to leave behind no trace of stone or bone. Such Ceilings occurred in the famous Brixham Cavern on the opposite shore of Torbay, but to their lowest surfaces there clung numerous stony and other relics of the deposits on which they had been moulded. After a careful study of the case, the Superintendents arrived at the opinion that the Ceiling was formed as a Floor on a deposit of fine earth, in at least its upper part, which once filled the Gallery to the necessary height; that this deposit, either by a considerable subsidence or by being washed out, was completely detached from the Floor which overlaid it; that subsequently a second and lower Floor was formed in the Gallery, and additions were made to both the upper and the lower surfaces of the Ceiling or first Floor. In support of this hypothesis it may be stated that the cream-coloured stalagmite forming the lower surface of the Ceiling, instead of being characteristic of the entire mass, was but a sort of "veneer," nowhere more than

an inch thick, and on being stripped off it was found that, both in texture and in colour, it was strongly contrasted with the material to which it was attached. The newly-exposed surface, and the surface only, had the exact colour of the Cave-earth; in fact it was soil-stained, and thus harmonized well with the hypothesis. Again, the abruptly truncated character of its eastern end or commencement rendered it not improbable that the Ceiling was a remnant of a Floor which formerly extended eastward into the Chamber, but which had there perished. Further, that a Floor had been destroyed, either wholly or partially, was conclusively proved by the fact that a large number of fragments of stalagmite were met with, incorporated in the existing Floor of Granular Stalagmite and also in the Cave-earth below, both in the Chamber and in the Gallery. [The Gallery was known to Mr. Mac Enery, who spoke of it as "a species of grotto." See *Trans. Devon. Assoc.* iii. 220, 276.]

In every portion of the Cavern yet explored, bones of various animals and pieces of Charred Wood were found in the Granular Stalagmite, but by no means abundantly. They were met with towards the base of the Floor, and generally in the concreted portion of it. The statement made in the First Report, that some of the species of animals represented in the Stalagmite were extinct, is confirmed; for several teeth of *Hyæna spelæa*, *Rhinoceros tichorhinus*, and a species of Bear, probably *Ursus spelæus*, were found in it within the last twelve months, and, with one exception, all of them in the Floor of the Gallery.

The Cave-earth, with a plentiful admixture of angular fragments and blocks of limestone, was met with everywhere beneath the Granular Stalagmite. Nowhere was there the least approach to stratification or a symmetrical arrangement of materials. Nor did an instance occur of Black Mould beneath the Stalagmite, or of its being commingled with the Cave-earth. In some localities the earth or loam was more, and in others less, abundant than the stones. Indeed, in a very considerable portion of the Passage of Urns the former was found very sparingly, the accumulation being almost entirely small pieces and blocks of limestone lying loosely together. In such cases the stalagmitic matter had occasionally infiltrated between the stones to a depth of from 1 to 2 feet, or even more, below its general level. Besides the pieces of limestone, the Cave-earth contained also small fragments of rock neither derivable from the Cavern hill nor, with the existing surface-

configuration of the district, capable of being carried into the Cavern by natural agency. None of them were angular, and most of them were well rounded. A very large proportion of them were pieces of different varieties of Devonian Grit, prevalent in the district, and found *in situ* in Lincombe Hill, rising immediately on the south-west to the height of 372 feet above mean tide, or upwards of 180 feet above the level of the Cavern Entrances. Quartz pebbles were also more or less abundant, and, no doubt, were commonly derived from the vein-stones which traverse the Grits just mentioned. Amongst them, however, there were one or two which, from the peculiarly vitreous aspect of the quartz, were probably derived from the Crystalline Schists composing the southern angle of Devonshire, and at their nearest approach, at the Start Point, upwards of fifteen miles from the Cavern. Nor were these the only examples of distantly derived materials, for well-rolled Flints were by no means rare, and examples of Granitoid and other Dartmoor rocks were met with. Many of these fragments were too small to have served any useful purpose, so that there was no probability of their having been selected by man. With the exception of such as occur on the recent, as well as the Raised, beaches on the adjoining coasts, and occasionally in "pockets" and fissures in the limestone hills, the nearest locality in which Flints are found *in situ* is Milber Down, about five miles distant towards north-west, where, overlying beds of Greensand, is a considerable accumulation of Supracretaceous Gravel, mainly composed of Flint as well as Dartmoor detritus. There can be no doubt that the Granitoid pebbles found in the Cavern were primarily derived from Dartmoor, which, where nearest, is at a distance of not less than twelve miles. It is not improbable, however, that these, the rolled Flints and the fragments of vitreous Quartz also, were relics of gravel once widely spread over south-eastern Devonshire, and of which that on Milber Down, already mentioned, is the nearest existing remnant.

The uniform depth of four feet below the base of the Granular Stalagmite, to which the excavation of the Cave-earth was carried, by no means extended everywhere to one and the same level. The lowest level reached was in the Gallery, where the deposit presented some peculiar features. While the first and second Foot-levels consisted of the ordinary Cave-earth with the usual admixture of angular fragments of limestone, the third and fourth Levels were to a very large extent made up of the *debris* of the red Grit, in the forms of

sand, subangular fragments, and pebbles occasionally 3 inches in diameter. [In fact, this was a deposit older than the Cave-earth, with which the explorers became subsequently well-acquainted, and termed "The Breccia."]

As already stated, a large number of blocks of stalagmite were found embedded in the Cave-earth. The first presented itself in the Chamber at about 40 feet from the Southern Entrance, whence, to the innermost extremity of the Gallery, they were more or less abundant. Some of them were of great size, measuring 5 feet long and 4 feet in breadth and depth, or 80 cubic feet. They were generally composed of distinct laminæ of highly crystalline prisms, having their longest axes at right angles to the plane of lamination. In one or two instances only were there any stones incorporated within, or attached to, them. In the Gallery they were confined to the first and second Foot-levels, but in the Chamber they occupied all Levels alike.

Though a large number of bones were found after the First Report was drawn, they were by no means abundant everywhere. Remarkably few were met with in the third and fourth Foot-levels in the Gallery, but in the upper two Levels they occurred in average abundance. Indeed the last spadeful of Cave-earth found in the Gallery contained a fine canine tooth of *Hyæna spelæa*. Again, in the Passage of Urns, where as already stated the deposit was almost exclusively made up of loose angular fragments of limestone, there were but few bones, and those which did occur lay in the small patches of Cave-earth which here and there, chiefly in the lowest Level, presented themselves. In short, though they occurred in the higher Levels in the Gallery and the lowest in the Passage, they were found in both only where the Cave-earth was found.

Many of the long bones were split longitudinally, and all thus split, as well as many others, were distinctly scored with teeth marks, probably those of the *Hyæna*. It was difficult to suppose, either *à priori* or from an examination of them, that less than human agency could have so divided them, and it was obvious that unless they were gnawed soon after they were riven they would scarcely be worth gnawing at all. [See *Trans. Devon. Assoc.* ii. 408-414.]

The labours of the last twelve months fail, it is believed, to add a new species to the list of Mammals given in the First

Report. Remains of *Hyæna* still preponderate; the Horse and Rhinoceros are probably next in prevalence; no bones of *Machairodus*, *Hippopotamus*, or Man have yet been met with, and, with one exception, the Elephant relics are those of small individuals.

Three teeth of *Elephas primigenius* are remarkable for their diminutiveness, even when compared with the smallest of those mentioned in the First Report. Indeed, one of them, No. 1063, found December 21st, 1865, in the fourth Foot-level of Cave-earth, in the Great Chamber, was no more than $\cdot 8$ inch long. [For a description of this tooth, see *British Fossil Elephants*, by Dr. Leith Adams, *Pal. Soc.* 1877-81, p. 85, and Plate ix. fig. 3.] The others, somewhat larger, were interesting from being peculiarly narrow in proportion to their length, and from the edges of the plates standing out in prominent ridges on the lateral surfaces. They were all found in the fourth Foot-level, but in three distinct Parallels.

Flint implements have been found in every portion of the Cavern yet explored—the Great Chamber, the Gallery, and the Passage of Urns. In the last they were just as numerous as elsewhere, occurring sometimes among loose stones where bones failed to present themselves.

Omitting mere chips and valueless flakes, upwards of 70 implements were found after the First Report was drawn, making with those previously reported something more than 100 specimens since the commencement of the exploration. About one-third of this total were met with in each of the first and second Foot-levels, and something more than one-sixth in the third. In short, each Level was rather less productive than those above it—a statement differing somewhat from that of last year. (See p. 202, above.)

The implements were divisible into three classes:—

1st. *Flakes*, probably struck off in making the more finished tools; but, doubtless, eminently useful for cutting or scraping.

2nd. *Lanceolate* tools, pointed at one end and truncated at the other.

3rd. *Ovoid* tools, convex on both sides, and worked to an edge all round the margin.

The largest mere Flake (No. 1093), found 30th December, 1865, in the fourth Foot-level of Cave-earth, in the Great Chamber, was nearly 5 inches long, and in greatest breadth and thickness 2·5 inches and 1 inch respectively. It was a portion of a nodule of coarse-grained light gray Flint, retaining in one part the original surface. As in the case of several

other flakes, its edges were so sharp and uninjured as to render it eminently probable that it was struck off in the Cavern, and had neither been used, nor exposed to the action of water in motion.

The Lanceolate implements were of two kinds—round-pointed and sharp-pointed. They were widest near the unpointed end; one surface had usually a central longitudinal ridge or keel, while the other was flat or concave lengthwise, but, whether flat or concave, apparently produced at a single stroke.

Of the round-pointed variety, a well-formed specimen was found in the Great Chamber, 46 feet from the Southern Entrance, in the first Foot-level of Cave-earth, over which the Granular Stalagmite was from 1·5 to 3 feet thick. It was about 2 inches long, ·75 inch broad, strongly carinated on one face, and longitudinally concave on the other.

A second and still finer implement (No. 808), found 14th October, 1865, in the second Foot-level of Cave-earth, under a thick Floor of Granular Stalagmite, was nearly 3·5 inches long, upwards of an inch in greatest breadth, and ·4 inch thick. The central longitudinal ridge, at about 1·5 inch from the broader end, bifurcated symmetrically as if a small flake had been struck off; hence the carinated face had three distinct surfaces, each being very slightly concave. The margin at the rounded point was occupied by several small facets, each produced, no doubt, by a separate and well-directed gentle stroke. The broader end was not sharply truncated but somewhat irregular, both lateral margins were slightly broken, and the inner face was longitudinally concave. Like the specimen just described, it was of very fine-grained flint of a light cream-colour.

The second variety of lanceolate implements differed from those just described, not only in being sharp-pointed at one end, but in tapering more rapidly near that end, in terminating in a thinner point near which the keel was gently curved, in having one lateral margin slightly convex and the other concave—conforming, in fact, to the deflection of the central ridge. In one specimen (No. 909), found 11th November, 1865, in the third Foot-level of Cave-earth, under thick Granular Stalagmite, in the Great Chamber, there were on the inner face, near the point, several very small marginal facets. This fine implement, or rather portion of one, was of white flint.

Among the lanceolate implements one (No. 942), found 20th November, 1865, in the third Foot-level of Cave-earth, under

thick Granular Stalagmite, in the Great Chamber, was sharply truncated at each end, the point having probably been broken off. It was 3 inches long, rather more than an inch wide at one end, and upwards of .5 inch at the other. Its flat face was produced by a series of blows, and suggests the ideas that the blow which detached the flake from the nodule left this a somewhat irregular surface; that a near approximation to flatness, and especially smoothness, on this side was essential for the performance of the work for which the tool was intended, and that the requisite character was produced by numerous minute chippings carefully and skilfully directed. The obverse also contained evidence of a more than usual amount of work expended on it, having two somewhat irregular and rudely parallel longitudinal ridges, as well as several facets. The lateral margins were not quite symmetrical. The tool was formed of fine-grained Flint, of light lead-colour inclining to whiteness.

No. 1163, found 15th January, 1866, in the fourth Foot-level of Cave-earth, beneath Granular Stalagmite about a foot thick and extending several yards without a break in every direction, in the Great Chamber, was the only ovoid implement found during the last twelve months. It was 4.5 inches long, 3.5 inches in greatest breadth, about 1 inch in greatest thickness, strictly oval in form, and having sensibly-perfect bilateral symmetry. Its opposite faces differed somewhat in convexity, and each of them displayed a large amount of chipping. This tool, quite the finest Flint implement exhumed during the present exploration, was formed of a somewhat coarse-grained greyish Flint, like those of the same class described in the First Report, Nos. 17 and 286 (see p. 202 above), and was dug out in the presence of the Secretary and two gentlemen who had accompanied him to the Cavern. [It is figured in Mr. Evans's *Ancient Stone Implements*, fig. 386, p. 447, and was the finest implement of its class found during the entire exploration.]

Besides the foregoing implements, all, as stated, found in the Great Chamber, there was one (No. 1515), met with 8 feet from the inner end of the Gallery, or 83 feet from the Southern Entrance of the Cavern, which seemed to connect the lanceolate and ovoid types—resembling the former in being pointed, and the latter in being worked to an edge round its entire perimeter. Its dimensions were less than those of any ovoid, and its breadth in proportion to its length exceeded that of any lanceolate, implement hitherto found in the Cavern. It was 3 inches long, measured 1.75 inch and

·4 inch respectively in greatest breadth and thickness, was nearly 1·25 inch wide at the broad end, attained its maximum breadth about midway in its length, and had lost its extreme point. It was formed of fine-grained cream-coloured Flint, and had that varnished or glossy appearance, or patina, which frequently characterizes ancient Flint tools. This implement, which seemed to have experienced rough usage, was found 8th May, 1866, in the second Foot-level of Cave-earth, beneath a thick continuous Floor of Granular Stalagmite, [and is figured in Evans's *Ancient Stone Implements*, fig. 389, p. 449].

Though, as already stated, the lower Levels have, on the whole, yielded fewer implements than the upper, it is equally true that hitherto those found in the third and fourth Foot-levels, and especially the latter, are the most highly-wrought implements. In glancing over all that have been dug out from the beginning of the exploration to the present time, it appears that while there are several interesting tools from the first Foot-level, and a larger number from the second, neither of these zones has yielded an ovoid implement; that from the third Level were exhumed the two best lanceolate forms; and that the two ovoid tools found in the lowest Level are very decidedly the most carefully finished specimens which the Cavern has yielded. In the present stage of the investigation the Committee think it neither desirable nor necessary to enter into any arguments to prove the artificial character of at least many of the Flints which they have found. Indeed, they speak for themselves, and in terms so unmistakeable that if they do not succeed in carrying conviction to the mind of the observer, any words that could be employed must certainly fail also.

It will be of interest, however, to call attention to certain other evidences of Human existence found in the Cave-earth. As already remarked, it was stated in the First Report that a Whetstone had been found below the Granular Stalagmite. Very shortly after that Report was drawn a second stone (No. 738) was met with, formed of a fragment of similar, though somewhat finer-grained, greenish Grit. Its form is not quite the same as that of the first specimen. Mr. A. Franks states that "it closely resembles some stones found in the Bruniquel caves, in form and material." It was found, September 28th, 1865, in the first Foot-level of Cave-earth, 43 feet from the Entrance, where the over-lying Granular Stalagmite was 26 inches thick, and extended many yards in every direction.

Several pieces of burnt bone were found in the Cave-earth in the Gallery—one in the first, and one in the third, but most of them in the second Foot-level. In each case the deposit was overlaid by a thick cake of Granular Stalagmite. Burnt bones were found in the Cave-earth in several parts of the Great Chamber also.

In conclusion, the Committee would remark that the careful and unremitting labour bestowed on the Cavern during the last year and a half has produced a large accumulation of facts, consistent with one another and with those recorded by the earlier explorers. Of the discoveries made, the uniform testimony is that beneath a thick Floor of Granular Stalagmite, so difficult to work as to require excellent tools and untiring perseverance, there are everywhere found, inosculating with bones of extinct mammals, and undoubtedly inhumed at the same time, Human Industrial remains, of a character so humble and so little varied as to betoken a very low type of civilization.

THIRD REPORT. Read at Dundee, September, 1867. (See *Rep. Brit. Assoc.*, 1867, pp. 24-34.)

Kent's Cavern, as at present known, may be briefly but roughly stated to consist of two "Divisions"—an "Eastern" and a "Western"—each comprising several Chambers and Galleries; and to have two external Entrances—a Northern and a Southern—each opening into the Eastern Division.

The Committee have found it convenient to assign names to the various portions of the Cavern; and, in order to avoid risk of confusion, they have retained those previously bestowed on certain parts by the Rev. J. Mac Enery and others.

The Northern Entrance opens, through a short narrow passage, into a somewhat spacious chamber termed "The Vestibule," measuring about 30 feet from north to south, and 35 from east to west.

From the north-western angle of the Vestibule, a gallery about 32 feet long, and varying from 6 to 14 feet broad, extends north-easterly and is known as the "North-East Gallery."

The Vestibule opens on its southern side into what is appropriately termed the "Sloping Chamber," about 70 feet in extreme length from east to west, and 34 in greatest breadth. This, so far as is at present known, is the only passage from the Eastern to the Western Division. [It is now known that the two Divisions are connected by a passage at the Southern end of the Eastern Division.]

A passage about 22 feet long and from 19 to 27 feet broad, termed by Mr. Mac Enery the "Passage of Urns," leads southwards from the south-eastern angle of the Sloping Chamber into the Great Chamber of the Eastern Division, mentioned in the First Report.

The Great Chamber opens southward into another measuring about 40 feet from north to south, and 26 from east to west. From the fact that during the last 20 years Mr. Vivian, a member of the Committee, has frequently lectured on the Cavern in this Chamber it has received the name of the "Lecture Hall"—a designation it is proposed to retain.

About 12 feet north of the junction of the Great Chamber and the Lecture Hall, a branch opens out of the eastern wall of the former in a south-easterly direction. It is about 7 feet wide at the Entrance, while its length, at present undetermined, exceeds 30 feet. The Entrance of a similar and apparently parallel branch occurs near the south-eastern corner of the Lecture Hall. In accordance with the names given them by Mr. Mac Enery when in a speculative mood, they are respectively termed the "North" and "South Sally Ports."

The Lecture Hall opens southward into an unnamed chamber about 17 feet wide and at least 50 feet long; but as its farther end is blocked up with large accumulations of stalagmite its true dimensions are at present unknown.

The exploration excites naturally much interest among the visitors and residents at Torquay, and attracts a considerable number of them; but while every reasonable facility is afforded them for witnessing the operations, no one is admitted to the parts under examination unless accompanied by one of the Superintendents. The other parts only are shown to visitors by the Guide appointed by the proprietor, Sir L. Palk, Bart., M.P. Such visitors, however, can only be admitted when the Committee's workmen are present, by whom, and not by the Guide, the keys are kept. In short, while every care is taken to find all the objects belonging to the deposits, every precaution is adopted to prevent anything being maliciously or mischievously placed in them for the workmen to find.

[While the Committee were impressed with a sense of the advantage and importance of allowing all who desired it to stand face to face with the Cavern phenomena, experience had taught them that the precautions described above were absolutely indispensable. Lists of the visitors accompanied

by the Secretary from time to time were given in the Annual Reports in the yearly volumes of the British Association. It may, however, be sufficient to say here that they included the names of various Royal Personages, Noblemen, Bishops and other Divines, Statesmen, Philosophers, Scholars, Scientists, Members of the Learned Professions, and Travellers from various European Countries, America, India, and many of the British Colonies.]

Hitherto the labours of the Committee have been confined to the Eastern Division, where the Great Chamber, the Gallery, the Passage of Urns, the Vestibule, and the North-east Gallery, have been completely explored to the depth of 4 feet below the bottom of the Granular Stalagmite, to which from the beginning, and as a first exploration, the excavation has been restricted. In the Lecture Hall, where the workmen are at present engaged, considerable progress has been made; and on its completion it is intended to proceed to the Chamber leading out of it southward.

Mr. Mac Enery and the other early explorers carried on researches in a part of the Vestibule and in the Lecture Hall, as well as in parts of the Western Division of the Cavern. Unfortunately, instead of taking out of the Cavern the portion of the deposits they had examined, they threw it simply on one side. The Committee have found it necessary to remove this disturbed material, and in doing this have examined it with just as much care as they bestow on virgin ground. The result has been the discovery of a large number of fine specimens of teeth and other relics of the ordinary cave Mammalia, which were either unnoticed or neglected by the early explorers. Indeed, the largest molar tooth of Mammoth which the Committee have yet found was obtained in this way. Cavern deposits, in order to their thorough examination, must be removed without the Cavern, partly to secure their final and complete investigation in daylight, and also to prevent the commingling of disturbed and undisturbed soil. Great as may be the palæontological value of the neglected specimens thus recovered, they can be of no service as evidence on questions of chronology or contemporaneity, as they were confusedly mixed with objects belonging to many and widely separated eras; hence the Committee have carefully kept them apart from specimens yielded by ground unquestionably intact.

Except in one limited locality to be noticed hereafter, the

succession of deposits in the Cavern has been uniformly the same as that described in the two previous Reports; viz:—

Firstly, or uppermost: Huge angular blocks of limestone.

Secondly: Black Mould, from 3 inches to upwards of a foot in depth.

Thirdly: Granular Stalagmite, varying in thickness from 3 inches to as many feet; but usually ranging from about 12 to 18 inches.

Fourthly, or lowest yet found: Cave-earth with small angular pieces of limestone, and occasionally rounded stones of kinds not derivable from the Cavern hill.

The excepted locality just mentioned was a part of the Vestibule, where a layer of black soil, consisting largely of charred wood, occurred beneath the Granular Stalagmite. This layer, termed the "Black Band," was of irregular outline, covered an area of about 100 square feet, and varied in thickness from 2 to 6 inches. Throughout about half its area it immediately underlay the Granular Stalagmite, but elsewhere the two were separated by an intermediate layer of ordinary Cave-earth from 3 to 6 inches thick. At its nearest approach it was about 32 feet from the Northern Entrance of the Cavern, but as great part of the intermediate ground had been broken by the earlier explorers, it is impossible to say whether or not it formerly extended farther in that direction. No trace of such material beneath the Stalagmite has been elsewhere encountered by the Committee. The Floor of Granular Stalagmite immediately overlying the Black Band was loaded with fallen blocks of limestone, heaped one on another, and cemented with stalagmitic matter into a firm grotesque pile, rising to the roof of the Cavern, and extending originally from its eastern almost to its western wall. Mr. Mac Enery states that when he first visited the Cavern, before some of the impediments were removed, the only passage—on the west side—was accomplished "on all fours." (See *Trans. Devon. Assoc.* iii. 218.) A few years ago Sir L. Palk had a more convenient passage cut through the pile on its eastern side; and in the course of their researches the Committee have had to remove the entire mass.

The Black Mould overlying the Granular Stalagmitic Floor yielded, during the last twelve months, a large number of objects, such as were described in the First and Second Reports, as well as several of which no examples had been previously found. Marine shells occurred everywhere in

this accumulation, but in the Vestibule they were unusually abundant, those of the Oyster forming sometimes considerable heaps. They could not in all cases be regarded as evidence of molluscou diet, since many of them, chiefly *Pectens* and Oysters, were certainly "dead shells," having *Serpulæ* and other small shells attached to their inner surfaces.

Potsherds were numerous; but though some of them were of considerable size, nothing approaching a perfect vessel was found. Judging from the various forms of ornamentation on them, the pieces represented a large number of utensils. In most cases they were composed of a coarse clay, having an admixture of small stones.

Three Spindle-whorls were added to the collection. One of them, composed of coarse Grit, differed from all the others yet found in having an ellipsoidal form; and, either for ornamentation or some unguessed useful purpose, a groove had been cut round its greatest circumference. The two remaining Whorls were of Slate, and had numerous ornamental lines. In this connexion may be mentioned an Amber "Bead," larger than some of the Whorls, and in form resembling the Grit Whorl just mentioned.

Flakes of both black and white Flint, but chiefly the former, occurred in large numbers, about 220 having been found in the Black Mould during the last twelve months. Almost all of them were met with in the Vestibule, and it is highly probable that at least many of the white specimens were dug up from the Cave-earth, and either lost or neglected by the early explorers.

Amongst the Metal articles were a small Bronze Hook, an almost perfect Bronze Socketted Celt [see Evans's *Ancient Bronze Implements*, ed. 1881, p. 206], a halfpenny of 1806, and a sixpence of 1846.

The Bone implements included an Awl; part of an object in form of a prism with the edges rounded, having on its surface a series of equidistant transverse grooves suggestive of a measuring tool; and two bone Combs and fragments of two others. The Combs belonged to the same class as that described in the First Report. (See p. 199 above.) One of them was small and rude; the other was larger, highly finished, had two parallel lines traversing its entire length in a zigzag series, and a hole at one end as if for suspending it. This interesting specimen, the two fragments of Combs, the Grit Spindle-whorl previously mentioned, a Cockle shell, several Potsherds, and a Bone cut with some keen-edged tool, all

belonging to the "find" No. 2587, were met with, on 10th June, 1867, in the south-eastern part of the Great Chamber, where the Black Mould was overlaid by a sheet of Stalagmite attached to the wall of the Cavern, and measuring from 1 to 2 inches thick, 7 feet from north to south, by 6 from east to west. Stalagmite, fully as thick, had in many instances been found on the large blocks of limestone lying on the Black Mould, but this was the first instance of Stalagmite immediately overlying the Black Mould. [No other instance of the kind was found anywhere in the Cavern.] The interest attaching to the case lies in the fact that in that part of the Cavern the lodgement of the Black Mould had closed before the formation of the Stalagmite lying on it began; and that a certain amount of antiquity is thus secured for the objects sealed up as just stated. In short, the geological evidence concurs with the archæological.

The Black Mould yielded a large number of bones of various Mammals and Birds, all probably of existing species except such as may have been dug up from the Cave-earth and cast aside or lost by the early explorers. The most interesting osseous relics found during the last twelve months were several parts of the Human Skeleton, including vertebræ, parts of lower jaws containing teeth, loose teeth, and a skull. The skull was 6 inches deep in the deposit, adjacent to the limestone rock, and immediately within the Northern Entrance to the Cavern. The other Human remains were met with in different parts of the Vestibule, and on different occasions. The first vestige of the Human Skeleton met with during the present exploration, was part of a lower jaw containing two molars, found in December, 1866.

The Granular Stalagmitic Floor presented its usual characters, being sometimes crystalline and extremely hard, at others granular and comparatively soft, not unfrequently composed of thin laminæ alternately crystalline and granular, and containing comparatively few extraneous objects. Amongst those which presented themselves were Stones of different kinds, Charcoal, Flakes and Cores of Flint, and remains of Bear, Fox, Horse, and Man.

The Stones, when not fragments of limestone, were commonly well-rounded, and were probably selected at the adjacent sea shore.

One of the artificially shaped Flints had the appearance of a fragment of a polished Celt or Axe, being the only specimen of the kind yet found in the Cavern. [No such speci-

men was subsequently found.] Since the Second Report was drawn 10 flakes and chips of probably artificial origin were met with in the Granular Stalagmite.

The human remains were a tooth and a portion of an upper jaw containing 4 teeth (No. 1930), found 3rd January, 1867, in the Vestibule, about 30 feet from the Northern Entrance to the Cavern, and deeply embedded in Granular Stalagmite 20 inches thick. These interesting relics were the most ancient remains of man's osseous system yet found in the Cavern. [Nothing of the kind was subsequently met with in or under the Granular Stalagmite.]

The Black Band below the Granular Stalagmite was extremely rich in objects, many of them of great interest, and including bones and teeth of *Rhinoceros tichorhinus*, Horse, *Hyæna spelæa*, Fox, Bear, and Badger; as well as Human tools of various kinds.

The indications of Man's existence just alluded to were Implements, Flakes, and Cores of Flint; Bone tools, and burnt bones.

The Flint specimens formed a total of 366, or about 10 on the average in every cubic foot of the material composing the Black Band. Though many of them were mere chips, and the majority of them simply flakes, no inconsiderable number were more or less perfect lanceolate implements. By far the greater number were white and had an almost chalky texture; and some were so extremely fragile as to break under the least pressure. It appeared utterly impossible to suppose that they were introduced into the Cavern by other than human agency, or that they had ever been moved from the spot where they were primarily lodged.

The Bone tools included an Awl (No. 1835), about 3·75 inches long, cut at one end to a sharp point, found 27th November, 1866, beneath Granular Stalagmite 16 inches thick and perfectly intact and continuous in all directions, and about 40 feet from the Northern Entrance to the Cavern. [See Evans's *Ancient Stone Implements*, fig. 407, p. 461].

The second Bone tool was a portion of a "Harpoon" (No. 1970), barbed on one side only, about 3·75 inches long, found 17th January, 1867. [*Ibid.* fig. 405, p. 460].

With the exception of the Black Band, occupying a very limited space in one part of the Cavern only, the deposit below the Granular Stalagmite was everywhere the Cave-earth, consisting typically of light red loam and small angular

fragments of limestone in about equal volumes, but in some places the loam was the more prevalent, and in others the limestone. Rolled stones not derivable from the Cavern hill occurred here and there in every part yet explored, and especially in the Gallery, as stated in the Second Report.

Blocks of Stalagmite, the broken remnants of an old Floor, were abundant, occurring at all levels both in the Cave-earth and in the undisturbed Granular Stalagmitic Floor, projecting occasionally through the latter to the height of a foot or more. Many of them were of considerable size, and one Block in the Lecture Hall measured fully three cubic yards. So far as is at present known no part of the Cavern is exempt from them, with the exception of that part of the Great Chamber extending from the Southern Entrance to 40 feet within it.

It was stated in the First Report that matter of probably faecal origin was frequently met with in the Cave-earth in the Great Chamber. A large quantity of this material, frequently forming considerable heaps, was found also in the southern portion of that Chamber; but with the exception of a few small pieces in the Lecture Hall, nothing of the kind presented itself elsewhere.

In the Lecture Hall, as well as in the immediately adjacent part of the Great Chamber, subterranean tunnels were occasionally broken into by the workmen. They were more or less cylindrical, sensibly horizontal, and usually upwards of 4 feet below the upper surface of the Cave-earth. Their size was tolerably uniform, and such as would allow a fox, or perhaps a badger to turn in them. Mr. Mac Enery, who mentioned them, thought, and with much probability, they were "Fox-earths." (*Trans. Devon. Assoc.* iii. 233-235.)

Fragments of burnt bones were found here and there in every Chamber and Gallery.

A very large number of teeth and other remains of the ordinary Cave Mammals were exhumed during the last twelve months, but it may be doubted whether any important addition was made to the list of Mammals given in the two previous Reports. As a provisional statement the Mammals represented by the collection may be still said to be Cave-lion, Cave-hyæna, Bear (more than one species), Badger, Fox, Horse, *Rhinoceros tichorhinus*, Mammoth, Ox, and several species of Deer. Many of the bones were of almost chalk-

like whiteness while others were discoloured, some were more or less coated with films of stalagmite, many were mere fragments or splinters, a considerable number were gnawed, those found under large blocks of limestones were crushed, several were split longitudinally in a manner betokening Human agency, they all had a greater specific gravity than those found in the Black Mould, they all adhered to the tongue when applied to it, and in no instance had the elements of a skeleton or anything approaching it been found together. It is still true that, so far as is known, no bone or tooth of Man, or Hippopotamus, or Machairodus has been found in the Cave-earth.

The Cave-earth also yielded a considerable number of flakes and chips of Flint during the last twelve months, the aggregate being 238, = 120 in the first or highest Foot-level, + 53 in the second, + 36 in the third, + 29 in the fourth or lowest. There were not among them any *ovoid* implements, nor can the series as a whole, perhaps, be regarded as quite equal in interest to those described in the First and Second Reports.

The artificially wrought Flints, inclusive of flakes and chips, found in the Cavern during the last twelve months, form a total of 834, = 220 from the Black Mould, + 10 from the Granular Stalagmite, + 366 from the Black Band, + 238 from the Cave-earth.

Though the Committee have not on this occasion the pleasure of laying before the Association any highly-wrought Flint implements, they have the gratification of producing tools formed of another material, and of a kind not previously found in the Cavern. Though it may be difficult to understand it, there is reason to believe that a few persons continue to be sceptical respecting the artificial character of even the best unpolished Flint implements in the Cavern or elsewhere. The Committee venture to believe that the evidence put into their possession during the last twelve months renders it impossible for anyone to doubt that Man occupied Devonshire when it was also the home of the Cave-lion, Cave-hyæna, Cave-bear, Rhinoceros, Mammoth, and their contemporaries.

Of the tools alluded to, two, the Bone Awl and Harpoon, found in the Black Band, have already been mentioned. These, however, were neither the only, nor the best, Bone implements exhumed. Two others were met with, and both in the Cave-earth below the Black Band. One was a portion of a highly-finished Harpoon (No. 2282), 2.25 inches long,

and differing from that previously mentioned chiefly in being barbed on two sides, the barbs, to use a botanical term, being "opposite," not "alternate," as is the case with many of the doubly-barbed implements found in certain French Caverns. It was found 18th March, 1867, in the Vestibule, in the second Foot-level, above which was the Black Band about 3 inches thick; over this again was the Granular Stalagmite 18 inches thick, unquestionably intact and without fracture or crevice of any kind; and superposed on this was the Black Mould. Like all bones found in the Cave-earth, the Harpoon when applied to the tongue adhered firmly to it, having, in short, the condition which from the spot it occupied might have been looked for. [See Evans's *Ancient Stone Implements*, fig. 403, p. 459.]

The second Bone tool was a well-finished Pin (No. 1929), found 3rd January, 1867, in the Vestibule, in the fourth or lowest Foot-level of Cave-earth, in contact with a molar tooth of *Rhinoceros tichorhinus*, and measuring 3.25 inches in length. There were vertically over it from 3 to 4 feet of Cave-earth; then the Black Band; over this the Granular Stalagmite 20 inches thick, perfectly intact and continuous in all directions; this was surmounted by the Black Mould; and the whole crowned with large blocks of limestone cemented with carbonate of lime into a firm mass and reaching the roof. The Pin was well made, almost perfectly round, tapered with considerable uniformity from head to point, and had a considerable polish. It was probably an article of the toilet, and hence the polish may have been the result of the use to which it was put. [*Ibid.* fig. 406, p. 460.]

[In addition to the Bone tools mentioned above, two others were exhumed in the Vestibule—a Needle or Bodkin on 4th December, 1866, and a Harpoon on 7th March, 1867—but their true character was not detected until late in 1868. For full particulars see the Fifth Report below.]

Each part of the Cavern in which up to this time the researches of the Committee have been carried on has been marked by some prominent facts. Thus, *ovoid* flint implements were found in the Great Chamber only, and there too the faecal matter was almost exclusively met with. Bone tools and the Black Band presented themselves in the Vestibule, but not elsewhere; and the same portion of the Cavern was marked by the great numbers of chips and flakes of Flint, and of blocks of *old* Stalagmitic Floor. Indeed the latter were so numerous and so piled on one another, especially on the western verge of the area occupied by the

Black Band, as to assume the aspect of a rudely formed wall. In the Lecture Hall, extremely few specimens of Flint occurred; but many of the blocks of *old* Stalagmite contained bones and teeth of the Bear. The blocks themselves were just as numerous in the other portions of the Cavern, but not one of *them* was found to be ossiferous.

Were we to speculate respecting the probable interpretation of the Black Band found beneath the Floor of the Vestibule—bearing in mind its very limited area, its position near the Northern Entrance of the Cavern and within the influence of the light entering thereby, its numerous bits of charcoal and of burnt bones, its bone tools and its very abundant, keen-edged, unworn, and brittle flakes and chips of whitened Flint—we might be tempted to conclude that we had not only identified Kent's Cavern as the home of one of our early predecessors, but the Vestibule as the particular apartment in which he enjoyed the pleasures of his own fireside; where he cooked and ate his meals, chipped Flint nodules, and cut and scraped bones into implements for war, for the chase, and for domestic use.

It is not improbable that some feeling of disappointment may rest in a few minds, and possibly something akin to rejoicing may find a place in others, at the fact that the labour which has been expended on this Cavern from the time of Mac Enery to the present moment, has failed to detect beneath the Floor of Granular Stalagmite any portion of the Human skeleton. The results of these labours, however, do not justify either of those feelings, nor do they increase our confidence in negative evidence. Mr. Mac Enery, at the end of the researches he carried on from 1825 to 1829, was able to report the discovery of Flint implements as the only indications of Human existence. To the same effect were the subsequent investigations of Mr. Godwin-Austen; and, in like manner, the Torquay Natural History Society, at the close of their search in 1846, were unable to report further than that they had found Man's Flint tools mixed up, in the Cave-earth, with the remains of extinct animals in such a way as to render it impossible to doubt their contemporaneity. In 1865, the Committee appointed by the British Association commenced the exploration entrusted to them; and for some months they too were unable to report more than the discovery of Flint implements.

In 1858, moreover, the celebrated Cavern at Brixham, on

the opposite side of Torbay, was discovered and methodically explored. The trustworthiness of the facts disclosed there may be said to have at once revolutionized the opinion of the scientific world on the question of Human Antiquity. The facts themselves, however, were essentially identical with those which Kent's Cavern had yielded, at intervals, for upwards of thirty years—Flint tools inosculating with the remains of extinct Mammals, in the Cave-earth, below a continuous floor of Granular Stalagmite. If ever merely negative evidence could establish a proposition, it seemed safe to conclude that the only traces of man contained by the ossiferous caves of Devonshire were the so-called Flint implements, about whose Human origin some persons were still sceptical.

The Kent's Cavern Committee, however, were enabled in their First Report to add the new facts that several pieces of burnt bone, as well as a stone having the appearance of a Whetstone, and undoubtedly of distant derivation, had been met with in the Cave-earth. Before the end of another twelvemonth their attention had been arrested by a further phenomenon, and in their Second Report they remarked that many of the long bones had been split longitudinally, and that it was difficult to suppose that less than Human agency could have so divided them. (See p. 210 above.) In this, their Third Report, they are able to advance another step, and to record the discovery of Bone tools, about the character of which there can be no difference of opinion; they have the mineral condition characteristic of bones found in the deposit they occupied; they occurred with the remains of extinct mammals in soil indubitably intact, one of them at the greatest depth to which the excavation has been carried, and all of them beneath a thick unbroken Floor of Granular Stalagmite, which has itself yielded remains of at least three of the extinct Cave Mammals. These successive discoveries, after labours so protracted, are calculated to warn us not to place implicit confidence in merely negative evidence; to encourage the hope that the bones of Man may yet be exhumed, though probably in sparing numbers only; and—though this hope may never be realized—to justify even the most cautious in holding and avowing the belief that Man was, in Devonshire, the contemporary of animals that had become extinct before the times of History or of Tradition.

Again, that Kent's Hole was largely visited in Romano-British and pre-Roman times, is testified by numerous and

varied objects found in the Black Mould; and that the curious frequently made excursions to it during the last century, may be safely inferred from statements in the works of the local historians Polwhele and Maton. (See *Trans. Devon. Assoc.* ii. 470-1.) But waiving this point, and going no further back than the last forty years, it is capable of proof that, within that time, the Cavern was visited by more than ten thousand persons—including not only scientific inquirers, but large pic-nic, dancing, and Bacchanalian parties. All the visitors had to be accompanied by the appointed guide, who was invariably paid for his attendance. The payments were generally made in the Vestibule; and it might have been expected that, from to time, money would have been lost, at least, in that part of the Cavern. Nevertheless, though the Black Mould has been most carefully examined, and has yielded a very large and most miscellaneous collection of objects, it was not until the close of twenty-one months that the labours of the Committee met with a pecuniary reward in the form of a halfpenny of George the Third. Two months afterwards they had the happiness of finding a sixpence of forty years later date. Besides these, no coin has been met with from the commencement of the work to the present time.

Further, in their First Report the Committee reminded those who were disposed to attach importance to the fact that Man's bones were not forthcoming as readily as his implements, that in the Black Mould, as well as in the Cave-earth, the only indications of his existence were remnants of his handiwork; that Pottery, Implements varying in kind and in material, the remnants of his Fires, and the relics of his Feasts were numerous, and betokened the lapse of at least two thousand years; but that there, as well as in the older Cave-earth, they had met with no vestige of his osseous system. This remained to be their experience, not only when their Second Report was sent in, but up to December last. Then the spell was broken by the discovery, in the Black Mould, of part of a Human lower jaw containing two molars. This, as has been stated, was followed by the exhumation, from the same deposit, of parts of other jaws, a skull, and other portions of the skeleton; and, as if to emphasize the fact, while these remains were being found, a fragment of a Human upper jaw containing four teeth was, as previously mentioned, detected deep in the next older formation—the Granular Stalagmitic Floor.

Lastly, during the last two years, the blocks of Stalagmite

previously mentioned have been found in every part of the Cavern yet explored, and in all parts of the deposits. Their structure indicated that they were portions of an old Floor, which, in some way not at present easy of explanation, had been broken up, and the fragments incorporated in the detrital accumulations subsequently lodged in the Cavern, and on which was formed that Granular Stalagmitic Floor which the Committee found intact, and were breaking up daily. This view of the origin of the blocks was confirmed by the fact that a considerable remnant of an old Floor still remained *in situ* in one part of the Cavern, and which, under the name of The Ceiling, was minutely described in the Second Report. Nevertheless, as the existing Floor often graduates downwards into a kind of breccia, and frequently contains bones, stones, and other extraneous bodies, it was reasonable to expect that some objects of the kind would be found attached to, or incorporated in, the blocks if they were really fragments of an old Floor which formerly spread over the Cavern. Accordingly, as the blocks presented themselves, all their surfaces were carefully examined, but no conclusive trace or indication of their having once covered a detrital mass was to be seen on any of them. The more thoroughly to sift this question, hundreds of them were broken by the workmen into small pieces, with the same invariable results—a structure indicative of stalagmitic origin, but without the disclosure of a trace of bone. At length, however, this large accumulation of negations was utterly set aside. On the 6th of last month (August, 1867), one of these blocks, in the second Foot-level of Cave-earth, in the Lecture Hall, was found, on being fractured, to contain a bone; and thus any lingering doubt respecting its claims to represent an old perished Floor disappeared at once and for ever. Since that time ossiferous blocks of Stalagmite have been found in the Cave-earth, in the same Hall, at least two or three times a week.

The foregoing facts are calculated to stimulate to continued research, and to encourage the hope that while a spadeful of deposit remains dislodged, a discovery may remain to be made.

FOURTH REPORT. Read at Norwich August, 1868. (See *Rep. Brit. Assoc.* 1868, pp. 45–58.)

In their Third Report the Committee stated that the Cavern consisted of two parallel Divisions or series of Chambers and Galleries, having, approximately, a north and south direction; that their researches had been confined to the Eastern Division,

in which the Vestibule, the North-east Gallery, the Passage of Urns, the Great Chamber, and the Gallery had been completely explored to the depth of 4 feet below the base of the Granular Stalagmitic Floor; that the investigation of the Lecture Hall had been begun, but that the greater part of it, as well as an unnamed chamber opening out of it, and the North and South Sally Ports, remained untouched.

The last twelve months have been devoted to the Lecture Hall and the unnamed chamber just mentioned. The exploration of the former has been completed, and, so far as an estimate can at present be formed, the latter will have been thoroughly investigated in about two months from the present time. There is, however, some uncertainty on this question, since the farther end of this chamber is closed with an enormous accumulation of Stalagmite, and it is not improbable that when this is removed the apartment may prove to be much larger than is at present supposed. The Superintendents of the work incline to the opinion that a gallery will sooner or later be laid open there leading into the Western Division. [This opinion proved to be correct. See the Fifth Report below.]

The Committee continue to follow the mode of exploration laid down at the commencement of the work, and described in detail in their First Report. The deposits are excavated in successive Foot-parallel, and each Parallel is removed in Foot-levels, to the depth of 4 feet beneath the lower surface of the Granular Stalagmitic Floor. In no instance has anything like a continuous limestone bottom of the Cavern been reached; but a depth greater than 4 feet would be incompatible with convenient, economical, trustworthy working, as it would be necessary to be continually putting up and taking down scaffolding or working-platforms, and there would be a great liability for the deposit to "cave in," which, by rendering it impossible to determine their exact positions and associations, would deprive the objects found of much of their interest, as well as of their value as evidence in geological chronology.

The Lecture Hall, continued:—In their Third Report the Committee stated that researches had been carried on in the Lecture Hall by Mr. Mac Enery and the other early explorers, who, instead of taking out of the Cavern that portion of the deposits which they had examined, threw it simply on one side. On the removal of this dislodged material, the Committee found that they had considerably over-estimated the

extent of the old working, and that by far the greater portion of the deposits in the Hall remained indubitably intact.

The objects met with, not only in the broken ground, but in every locality about which there was the least uncertainty, were carefully kept distinct from those found in undoubted virgin soil.

Without at present entering into details, it may be stated that in the Lecture Hall the deposits were of the same general character and order as in those parts of the Cavern which the Committee had previously explored and reported on—Cave-earth of unknown depth, completely sealed up with a Granular Stalagmitic Floor, which, in its turn, was covered with a layer of Black Mould.

The objects found in the Black Mould were less numerous than, but similar to, those described from the same accumulation in previous Reports. Amongst them were several pieces of pottery including part of a small Vase, a small red earthenware Pan, a Spindle-whorl, a roughly shaped piece of New Red Sandstone, a portion of a bone Comb, Marine Shells, a small piece of smelted Copper, the entire lower jaw and an almost complete skull of a Badger, part of a Human upper jaw with eight teeth, of which four were still in their sockets, and the internal cast of a fossil shell.

Most of the Potsherds were of coarse black clay mixed with small stones, some of them were ornamented, while others were plain, and, in short, they closely resembled those described in the previous Reports.

The red earthenware vessel is no doubt a Pan of the kind used for flower-pots to stand in, and is clearly modern.

The Spindle-whorl was of clay-slate, measured an inch in diameter and half an inch in depth, and was ornamented with a series of lines both on its curved and flat surfaces. It is, perhaps, worthy of remark that, though the Cavern has yielded Spindle-whorls formed of different kinds of stone, the best made, the most highly finished, and the only ornamented specimens were of Slate.

The piece of Red Sandstone was perhaps a Spindle-whorl marred in the making. Good specimens formed of the same material were found in the Cavern in previous years. It was rudely of the required form, about the size of a rather large Whorl, but imperforate.

But for the more or less perfect specimens found in previous years, it would not have been easy perhaps to identify the fragment of bone Comb. It was but a portion of what might be called the shaft, both ends having been broken

off. It was of the same type as those described in previous Reports, all of which had their teeth at one end; but it differed from all those found before in being ornamented with well-drilled, small, circular punctures, traversing the shaft obliquely in two parallel series, the direction of one set being at right angles to that of the other.

The marine shells were chiefly those of Oyster, Cockle, and Pecten. One of the last had, near its anterior margin, a small elliptical hole, probably artificial.

The human jaw and teeth (No. 2788) may be comparatively modern. They were submitted to Messrs. Rodway, the eminent dentists of Torquay, who stated that "several of the alveoli possessed peculiar irregularities, which confirm other unmistakeable evidence that the whole of the teeth belonged to the same individual; that the loose teeth were considerably worn away, particularly the canine, at the end of which is exostosis, which was caused by the whole, or the greater part, of the mastication of later years being performed by the canine; that they were the teeth of an old person, probably a male; and that they would be likely or certain to preserve their freshness of aspect for an indefinite period."

The cast of the fossil shell was apparently Oolitic, and perhaps recently lost in the Cavern by some geological tourist just arrived from the neighbouring Jurassic district of Dorsetshire.

With the exception of the ground broken by the early explorers, as already mentioned, the Granular Stalagmitic Floor was everywhere continuous. It varied from 2 to 32 inches in thickness, but rarely measured less, and commonly more, than 6 inches. It was generally of Granular structure, but occasionally Crystalline, and sometimes made up of alternate Crystalline and Granular layers. It contained numerous blocks of limestone and of old Stalagmite; the former had no doubt fallen from the roof from time to time, and some of them measured as much as 4 feet in length. In addition to such as were completely incorporated in the Floor, many, as in other portions of the Cavern, were lodged in and rose above it, whilst others projected from it downwards into the Cave-earth.

The embedded masses of Stalagmite were invariably of a structure unlike that of the Floor in which they were lodged, being in all cases at once finely laminated and highly crystalline, the latter character being displayed in a columnar or fibrous structure at right angles to the laminae, whether the latter were plane or curvilinear. In some cases, these

blocks, like those of limestone just mentioned, projected above or below the Floor into the Black Mould or Cave-earth respectively, whilst others were completely incorporated in the Granular Stalagmitic Floor. It cannot be doubted that they were fragments of an older Floor, which, as stated in previous Reports, and especially the Third, had been partially broken up at a comparatively early period in the Cavern's history. It will be convenient therefore to speak of the Floor represented by these blocks as "The Crystalline Stalagmitic Floor," while that immediately overlying the Cave-earth retains the name of "The Granular Stalagmitic Floor."

Bones were occasionally found, as in previous years, in the Granular Stalagmite, the most important being a fine molar tooth of *Rhinoceros tichorhinus*, a premolar of *Hyæna spelæa*, two or three molars of Bear, a large part of a humerus of Bear, and a large os calcia.

The teeth of *Rhinoceros* and *Hyæna* (No. 2811) were found 21st September, 1867, in the presence of the Secretary, lying together very little below the upper surface of the Stalagmite. Hence, since the times of *Rhinoceros tichorhinus* and *Hyæna spelæa* in Devonshire, the increase of thickness of the Granular Stalagmitic Floor in that part of the Cavern has been barely sufficient to cover these interesting relics.

A few examples of charred wood were found in the same Floor.

The composition of the Cave-earth was usually of the ordinary character—about equal parts of light red loam and of comparatively small angular fragments of limestone. In this condition it almost invariably contained bones, but when either loam or stones were greatly in excess bones were very rare. In a few instances the deposit was a mixture of fine earth and sand resembling ordinary road-washing, and contained no trace of bone.

The Cave-earth yielded a considerable number of fragments of dark red Devonian Grit and other stones, huge blocks of limestone, large masses of Crystalline Stalagmite, and loose lumps of rock-like Breccia.

The Grits could not have been derived from the Cavern hill, but were probably furnished by neighbouring loftier eminences. Their sub-angular and rounded forms indicated the rolling action of water, but their introduction into the Cavern by this agency would require either that the district should have a configuration very unlike that which obtains at

present, or that the Cavern should have an entrance on the western side of the hill, where none are known at present. [Entrances on that side of the hill were discovered in 1878, and described in the Fifteenth Report. See below.]

There were found with the fragments of Grit angular and rounded pieces of Quartz and Flint, and a small angular piece of Crystalline Schist, not found *in situ* in any part of the Torbay district, but characteristic of the southern angle of Devonshire, or what may be called the Start-and-Bolt district. A pebble believed to have been derived primarily from the same locality was mentioned in the Second Report. (See p. 209 above.)

The blocks of limestone occurred at all levels in the Cave-earth; they were quite angular, and some of them many tons in weight.

The masses of Crystalline Stalagmite were of the same structure as those, already described, in the Granular Stalagmite, and were found everywhere in the Cave-earth, in the form of huge cuboidal masses with sharp edges. The Floor of which they are obviously remnants, must have been fractured along planes at right and other high angles to its upper and lower surfaces. There appears to have been no instance of division in planes even distantly approaching parallelism with these surfaces. Many of them contained teeth and bones, all, so far as is known, remains of the Bear.

The loose lumps of rock-like Breccia were of a more or less rounded form, and composed mainly of rounded and sub-angular pieces of dark red Grit, in a sandy paste of the same colour, with a few small angular pieces of limestone, the whole cemented firmly. Almost all of them were crowded with teeth and bones, believed to be, at least, almost exclusively those of Bear. No teeth-marks were detected on them, nor were there any traces of faecal matter. Many of the canine and molar teeth were of great size, and some of the former were very much worn.

The lumps of Breccia had not the appearance of being portions of the ordinary Cave-earth conglomerated *in situ*. Their aspect was rather that of remnants of a deposit older than that in which they were incorporated—the deposit probably which the Floor of Crystalline Stalagmite had covered, and on which it had been formed. To a large extent this opinion received confirmation in the fact, already mentioned, that the osseous remains in the lumps of Breccia, like

those in the blocks of Crystalline Stalagmite, were, so far as was known, those of Bear, the other members of the Cave-earth fauna being unrepresented.

The Cave-earth in the Lecture Hall contained teeth of Horse, Rhinoceros, Hyæna, Bear, Fox, Deer, Mammoth, Lion, Ox, and Badger; their prevalence being indicated by the order of their names—those of Horse being the most, and of the Badger the least, abundant. The teeth were accompanied by a considerable number of bones, many of them deeply scored with teeth-marks, others split longitudinally, and several invested with thin films of Stalagmite irrespective of the depth at which they were found. These different conditions of the bones were interesting and significant,—the first implying the presence of living Hyænas; the second the operations of Man; and the last the slow and intermittent accumulation of the Cave-earth, since each such bone must have lain on what was the *upper* surface of the deposit for a considerable period, during which it was exposed to the action of the lime-laden drip from the roof of the Cavern.

The statement in the Third Report to the effect that but little faecal matter occurred in the Cave-earth in the Lecture Hall (see p. 222 above) requires considerable modification, for during the last twelve months a greater quantity of this material was found there than had previously been met with in the adjacent Great Chamber. It occurred at all levels, and occasionally in masses a foot high; while individual coprolites were occasionally encountered which had undergone no change of either place or form since they were originally dropped by the Hyæna—a fact going far to show that the Cave-earth was neither all introduced at one and the same time, nor by violent agency such as a great rush of water.

The Lecture Hall was not very productive of Flint tools or, with the exception of Split bones, other evidences of Human existence. Omitting mere chips and doubtful flakes, it yielded no more than five Implements, all very inferior to the fine specimens discovered in previous years. Two of them were discovered in the first Foot-level, two in the second, and one in the third. One was formed of grey cherty Flint of a kind frequently employed by the old men of Kent's Hole; the others were of a finer variety, and of the prevalent white colour, while they all belonged to the Lanceolate type.

No. 2916, the best of the series, that composed of cherty

Flint, was found 18th October, 1867, in the first Foot-level of Cave-earth, and had lost its point before it was met with. It measured 2·8 inches in length, and 1·3 inch in greatest breadth, did not appear to have had much skilled labour expended on it, and was considerably broken at the edges.

The South-west Chamber:—The Lecture Hall, as already stated, opens on its south-western side into an apartment, which, on account of its position in relation to the other portions of the Eastern Division, has been termed the "South-west Chamber." It is at present comparatively small, but when completely emptied may prove to be much larger. At its junction with the Lecture Hall the space between the opposite walls of the Cavern is inconsiderable; and this, before the workmen commenced their excavations, was much diminished by an enormous mass of limestone fallen from above, and estimated at upwards of 100 tons. Its base was buried from two to three feet deep in the Cave-earth, while its summit reached a height of fully six feet above the Floor of Granular Stalagmite. On account of its form it was commonly known as the "Pulpit Rock," but it not unfrequently received the appellation of the "Lecturer's Rostrum," mainly because, when lectures were delivered on the spot on the history and formation of the Cavern, the speaker always took his stand on this rock, his audience being assembled in the adjacent Lecture Hall. The removal of the Pulpit absorbed a considerable amount of time, but it was quite indispensable in order to the excavation of the Chamber the entrance of which it guarded.

In the South-west Chamber there was no trace of the overlying Black Mould. This accumulation had presented itself in every other part of the Eastern Division, with the single exception of the inner portion of the Gallery in the western wall of the Great Chamber, where it gradually thinned out, as previously stated. It covered the entire Floor of the Lecture Hall to a depth as great as in any other part of the Cavern, but it terminated abruptly at the Pulpit Rock, and was not resumed beyond it.

In 1846, a Sub-committee of the Torquay Natural History Society, consisting of Dr. Battersby and the Superintendents of the present work, commenced a search in this Chamber, when they broke up the Floor of Granular Stalagmite over a rudely circular area about 6 feet in diameter. They excavated the underlying Cave-earth to the depth of about two feet,

when, having found nothing, they abandoned the search, leaving the pit empty and the materials dug out of it lying in a heap near. Probably no part of the Cavern is in wet weather much more exposed to drip than this; hence it might have been expected that here, if anywhere, twenty-two years would have produced a film of stalagmite of appreciable thickness. Yet not a film was to be found either at the bottom of the pit, on the section made in digging it, or on the Cave-earth thrown out of it. This remote part of the Cavern was very rarely entered by visitors, and the operations of nature went on with little check or interference; but everything was found precisely as it was left upwards of twenty years ago.

The form of the South-west Chamber, as well as the huge accumulation of Stalagmite on its western side, rendered it expedient to excavate the deposits it contained in two distinct Series of workings—an Eastern and a Western, the working direction in the former being southward, and in the latter westward. The first has been completed, and considerable progress has been made in the second.

With the exception of the part broken by the Torquay Natural History Society, the Granular Stalagmite was everywhere perfectly continuous throughout this Chamber, averaging 28 inches in thickness; in one instance only it was no more than 6 inches; it was very seldom so little as a foot; and it several times attained to 5 and even 6 feet. It was commonly Granular except at and near its junction with the walls of the Cavern, where it frequently consisted of thin crystalline laminæ, and was extremely hard and tough. Numerous angular masses of limestone were found in it, and some of them were of great size; but there were no incorporated blocks of Crystalline Stalagmite.

In the northernmost or first eight Foot-parallels in the Eastern series, the Cave-earth occupied each entire section, from the bottom of the Granular Stalagmitic Floor to the base of the lowest or fourth Foot-level. It was of the ordinary type, and, like that in most other parts of the Cavern, contained large blocks of limestone and of Crystalline Stalagmite, as well as lumps of Breccia, such as had presented themselves in the adjacent Lecture Hall.

In the more southerly parallels there was found at the base of the section, and extending quite across it from end to end, a deposit, *in situ*, of a new type, on which the Cave-

earth at once rested. This proved to be a rock-like Breccia composed of red sandy earth, angular pieces of limestone, subangular and rounded pieces of Grit in considerable numbers, blocks of Crystalline Stalagmite, and bones, all cemented into a firm and hard concrete; in short, with the single exception of its being undisturbed, it was of precisely the same character as the loose lumps of Breccia previously met with in the Cave-earth in the Lecture Hall. In each succeeding Parallel it rose higher and higher in the section, the overlying Cave-earth gradually thinning out.

Six feet south of its first appearance, this Breccia was found to be immediately overlaid by a Floor of Crystalline Stalagmite nearly 2 feet thick, separating it from the Cave-earth above; in short, there were in this Parallel, in the same vertical section, two Floors of Stalagmite, each immediately overlying the detrital accumulation on which it had been formed. From this point to the end of the Eastern series every Parallel disclosed the two Stalagmitic Floors; but with every additional foot southwards, the intermediate band of Cave-earth became thinner and thinner, until, before the southern wall was reached, it altogether disappeared, and the one Floor rested at once on the other. These two accumulations of Stalagmite were commonly distinguishable by their different structures—the upper being Granular except near the wall of the Cavern, the lower invariably Crystalline.

In a few of the southernmost Parallels, the materials at the bottom of the sections were not cemented into a rock-like mass, and there were but few bones mixed with them. In all other respects they were identical with those of the Breccia immediately above.

It has been already stated that the Granular Stalagmite was everywhere continuous. Instead of this being the case with the Crystalline Floor in this series, it usually extended from each end of the section several feet towards its centre, but in all cases terminated more or less abruptly, leaving an interspace, sometimes as much as 7 feet wide.

In this portion of the Cavern, where the conditions were at once so novel and so variable, the work was watched with the utmost care, and accurate measurements and descriptions were frequently made and recorded. The following sections from different parts of the Chamber will show in a general way the succession of the deposits, in descending order:—

SECTION I. Near the northern end of the Eastern series of workings in the South-west Chamber. Length 21 feet at the

top, and 11 feet at the bottom. Direction from W. 5° N. to E. 5° S. (mag.).

First, or uppermost: Granular Stalagmite, continuous, contained large masses of limestone; thickness varied from 28 to 36 inches.

Second: Cave-earth, typical, contained a considerable number of large blocks of limestone and a few pieces of Crystalline Stalagmite; thickness unknown, but more than 4 feet.

SECTION II. Near the middle of the Eastern series of the South-west Chamber. Length 15 feet. Direction from W. 5° N. to E. 5° S. (mag.)

First, or uppermost: Granular Stalagmite, continuous, no incorporated stones; thickness varied from 17 to 29 inches.

Second: Cave-earth, typical, contained large pieces of limestone and Crystalline Stalagmite; thickness varied from 3 inches at the ends of the section to 12 inches in the middle.

Third: Crystalline Stalagmite, discontinuous, there being a considerable hiatus near the middle of the section; thickness 14 inches.

Fourth: Rock-like Breccia, composed of red sandy earth, small angular pieces of limestone, subangular and rounded pieces of Grit, large angular masses of limestone and of Crystalline Stalagmite, the whole cemented into a strong concrete; thickness unknown, but more than 31 inches. The Cave-earth rested immediately on it near the middle of the section, where there was no Crystalline Stalagmite.

SECTION III. Near the southern end of the Eastern series in the South-west Chamber. Length 8 feet. Direction from W. 5° N. to E. 5° S. (mag.)

First, or uppermost: Granular Stalagmite, continuous, no incorporated stones; thickness varied from 18 to 21 inches.

Second: Crystalline Stalagmite, discontinuous; thickness varied from 8 to 38 inches.

Third: Rock-like Breccia, in all respects like that of the 2nd section; thickness 2 feet.

Fourth: Uncemented Breccia, differing from the overlying mass only in being incoherent and in containing but few bones.

The Granular Stalagmitic Floor in this portion of the Chamber, as elsewhere in the Cavern, was found to contain a few bones and pieces of charred wood. Of the former, the most important were part of the upper jaw of the Cave-bear (No. 3252), found 15th February, 1868, containing both

canines and two molars, none of which were much worn. With this fine specimen, extracted in the presence of the two Superintendents, several loose molars of Bear were found, and also a claw of some large carnivore. Besides the foregoing, there were found elsewhere in this Floor a fine canine tooth of Bear, which did not appear to have seen much service, and an *os calcis* of some large animal.

The Cave-earth, too, no matter how thin the band to which it had dwindled, continued to the last to yield remains of its characteristic fauna. In this deposit there were found, in the series now under notice, teeth and other relics of Bear, Fox, Horse, Hyæna, Rhinoceros, Mammoth, Hare, and Bird. Their frequency, rather than the aggregate number of specimens in each case, is indicated by the order in which the names stand, the remains of Bear being most prevalent, whilst those of Bird were found once only. In the same portion of the Cavern was found the femur of a Bear, having the distal end perfect, but the proximal extremity wanting. This is the largest bone found during the present exploration; it was lying, with the anterior portions of the two rami of the lower jaw of a young *Hyæna spelæa*, in the fourth Foot-level.

As elsewhere, many of the bones were well scored with teeth-marks, and some were split lengthways. Lumps of faecal matter were also occasionally met with.

A few Flint chips were likewise found. Probably of artificial origin, but not of sufficient value to require description.

Though fragments of stone which the Cavern hill could not have supplied were much more abundant in the Breccia than in the Cave-earth, none of very distant derivation were observed: no pieces of Granite from Dartmoor, or of Crystalline Schist from the Start and Bolt, or even of Slate from the more immediate neighbourhood, all of which have been found in the Cave-earth.

The Breccia was so extremely hard and difficult to work as to render it necessary to split it out with chisels, which frequently played sad havoc with the bones it contained. These were sometimes so abundant as to form fully 50 per cent. of the entire accumulation. To use the language of one of the workmen, "they lay about as if they had been thrown there with a shovel." The progress of the work, as in some other cases, has rendered it necessary to qualify somewhat the first impressions respecting the bones and teeth. Instead of "exclusively the remains of Bear," it may be said that

"almost exclusively" they are so; for recently there have been found amongst them a tooth of some Cervine animal, a tooth of Fox, and one or two bones of Bird. Nevertheless, it still remains to be a fact that in this deposit there have not been identified at present any relics of Rhinoceros, Horse, Ox, Mammoth, Badger, Lion, or Hyæna, all of which were so frequently exhumed from the Cave-earth; nor are there any traces of fæces, or, with one solitary and doubtful exception, of gnawed bones.

The bones found in the Cave-earth were divisible into two classes with respect to their colour. The first included specimens of an almost chalk-like whiteness, and were very numerous; the second those having a dark tinge, and were very few. The dark hue of the second class was merely a surface discoloration. Beneath a thin superficial film, the bones of this group were just as white as those of the other. The colour of the specimens found in the Rock-like Breccia differed from that of each of the foregoing series; all of them being characterized by the same somewhat light coffee-coloured tinge, which, more or less, penetrated their entire substance.

None of the Breccia fossils appeared to have been rolled, or to have been fractured before they were lodged in the place in which they were found. Fragments of jaws were numerous, and many of them contained teeth; but, with this exception, the relics lay together without the least reference to their anatomical relations.

In many respects their condition was precisely the same as that of the specimens in the Cave-earth. Thus, those found beneath large fallen blocks of limestone were crushed, the several parts remaining in position, and commonly held together by some firm cement. Again, other specimens were covered with a film of Stalagmitic matter. Further, the bones from the older deposit adhered to the tongue just like those found in the Cave-earth, and no distinction could be drawn between the two series from this quality alone. These facts show, firstly, that the more ancient formation, like the less ancient one, was compact, firm, unyielding, and capable of offering resistance to a heavy falling block; secondly, that, as has been already remarked in the case of the Cave-earth, the bones had successively lain exposed on the surface for a long period, and that the materials of the Breccia were introduced into the Cavern at many different times, with protracted intermittences.

Up to this time, the Breccia has been utterly silent on the question of the existence of Man; having given up no

tools or chips of Flint or Bone, or Charred wood or bones, no Bones split longitudinally, no stones suggesting that they had been used as Hammers or Crushers. But while they have before them the lessons so emphatically taught by their exploration of the Cavern the Committee cannot but think that it would be premature to draw, at present, any inference from this negative fact.

In the Western series in the South-west Chamber, the very difficult exploration of which is now in progress, the thickness of the Stalagmitic Floor surpassed everything of the kind previously met with. Up to this time it has averaged more than 7 feet, in two instances only and over very limited spaces it was so little as 3 feet, and it has reached so much as 12·5 feet.

Cave-earth presented itself at the northern end of each section in the first seven Foot-parallels only, where it was rapidly thinning out, both southwards and westwards. It was covered with its own Floor of Granular Stalagmite, and rested on the Crystalline Floor of the same material, beneath which lay the Breccia. This, so far as is at present known, was the termination of that great deposit of Cave-earth which, in unbroken continuity, had been followed from the Entrances of the Cavern; had yielded so many thousands of bones of extinct animals, and at least hundreds of Man's Flint and Bone implements and their concomitant chips. It will be shortly seen that, to the last, it was true to its character.

As in this series the Granular Floor rested at once on the Crystalline one and sometimes assumed a crystalline structure, especially beyond the line at which the Cave-earth disappeared, it was not always easy to say how much, if any, of the great thickness just spoken of was to be ascribed to the period which separated the era of the Breccia from that of the less ancient Cave-earth, and how much to the time which has elapsed since the introduction of the latter deposit terminated.

In the upper part of this enormous accumulation of Stalagmite some examples of charred wood were found; and several stalactites, which no doubt had dropped from the roof above, were met with lodged in the mass. There were a few peculiarities in the structure of this Stalagmite which have not at present been noticed elsewhere. It sometimes had a honey-combed or cellular structure, and in other places was traversed in various directions by a series of tubular cavities, both of which greatly contributed to the difficulty which the work-

men experienced in breaking it up; for while the cavities did not appear to diminish the strength of the mass, they allowed the ignited gunpowder room to expand, and thus rendered it almost impossible to excavate it by blasting. When it is added that the Stalagmite was not traversed by great divisional planes, as almost all rocks are, and that it nearly filled the Chamber to the roof, it will be seen that the exploration required very pertinacious and skilful labour.

It has been already stated that but few Flint implements were found in the Lecture Hall, that these were much inferior to those taken to the Association in previous years from other parts of the Cavern, and that the Eastern series in the South-west Chamber yielded a few chips only. It was, perhaps, not unreasonable to ascribe this paucity to the comparative remoteness of the branches of the Cavern in which the researches were carried on during the last twelve months. Be this as it may, the Superintendents had but little hope or expectation that better fortune was awaiting them so long as the work was carrying them day by day farther on in the same direction. Scarcely, however, had the exploration of the Western series in the South-west Chamber commenced, when the spell was broken.

On 25th June, 1868, a good Flint implement (No. 3844), was found 2 feet deep in the Cave-earth, in a small recess in the limestone wall, and sealed up with Granular Stalagmite 80 inches thick. It was found broken into apparently four pieces, three of which were recovered. Some of the fractured edges were coated with Stalagmite. It lay with a fine almost unworn molar tooth of Bear, a molar of Horse, and a few other teeth including one of Fox.

On 4th July, 1868, a second Flint Implement (No. 3869) was found 2 feet deep in the Cave-earth, over which the Granular Stalagmite was 32 inches thick. With it were a few bones, and immediately below it 13 molar teeth of Horse, a canine of Hyæna, and a gnawed bone. It was of the lanceolate type, and one of the finest Implements found in the Cavern. It was barely 4·2 inches long, 1·2 inch in greatest breadth, ·5 inch in greatest thickness, strongly carinated on one face, sharply pointed at one end, rounded at the other, and keen-edged all round its perimeter, but probably never used after being last retouched. Its colour was partly white and partly a dull drab. It was dug out in the presence of the Secretary. [See Evans's *Ancient Stone Implements*, fig. 391, p. 451.]

On 10th July, 1868, a third Implement (No. 3884) presented itself in the third Foot-level of Cave-earth, over which

the Granular Stalagmite was 24 inches thick. It was a fine specimen of almost uniformly white Flint, but scarcely equal to No. 3869, which, excepting that it was not quite so broad, it nearly resembled in size and form.

A fourth Implement (No. 3900) was met with on 25th July, 1868, in a recess in the limestone wall of the Chamber, in the first Foot-level of Cave-earth, over which the Granular Stalagmite was upwards of 7 feet thick. It was probably not so fine a specimen as either of the last mentioned two, but was unfortunately broken by the workmen, who were unable to recover all the fragments. Judged from the exterior, it would have been termed white flint, but the fractures showed a uniformly black interior. It was lying with 11 molar teeth of Horse, a sectorial tooth of Hyæna, a canine of Fox, several bones and fragments of bone, and a few small lumps of faecal matter.

Thus, within about one month, four Flint implements, all of them good, and two of them very fine, specimens, were found within a distance of 5 feet from one another, and from 140 to 150 feet from the nearest external Entrance to the Cavern. They were attended by the usual accompaniments, and with the last of them the Cave-earth ended in that direction, so far as was known.

The Breccia in this portion of the Chamber presented the ordinary characteristics, and called for no remark.

In their Third Report the Committee called attention to the facts which, successively and slowly discovered, had led to the conviction that there had been a chapter in the history of the Cavern earlier than that represented by the Cave-earth. It has been already stated that further and most conclusive evidence on the point presented itself during the last twelve months. The case is of so much interest, so characteristic of Cavern researches, and so full of instruction and encouragement that it may be worth while to give a brief recapitulation of the facts from the beginning:—

1st. The Committee had been at work upwards of five months when cuboidal blocks of Crystalline Stalagmite first appeared in the Cave-earth and in the overlying Granular Stalagmitic Floor. After much deliberation, it was concluded that they were fragments of an older Floor, which had covered a deposit of still higher antiquity, and had been wholly or partially broken up before or during the introduction of the Cave-earth and the formation of the Stalagmite in which the blocks were lodged. To this there was the

great objection that there were no bones either within or attached to the blocks.

2nd. After the labour of six additional months, during which every day disinterred blocks of Crystalline Stalagmite, but with the same negative characters, a large portion of such an old Floor was actually found *in situ*, but without having on its lower surface any visible trace of a deposit which it had once sealed up. Though the probable interpretation was that the deposit had been washed out, or had sunk away from the Floor through failure of support at its base, it seemed reasonable to suppose that, in either case, stones or other remnants of it would be found attached to its lower surface. Instead of presenting such relics, however, this lower surface was a beautiful cream-coloured plate of stalagmite, bristling with short stalactites of the same colour.

3rd. In order to determine whether the so-called Remnant of old Floor was really stalagmitic throughout, holes were bored through it, which not only decided the question affirmatively, but caused a portion of the nether surface of the hypothetical remnant to scale off, and to disclose the fact that the "cream-coloured plate" was but a modern veneer formed on what had been the original lower surface; and this, when thus laid bare, proved to be soil-stained and crowded with small particles of detrital matter—relics of the missing mechanical deposit.

4th. After this, seventeen months passed, and though in the meantime blocks of Crystalline Stalagmite were found everywhere and some of them of great size, and though the workmen purposely broke them into small pieces, still no bone was found within or projecting from them. At length, at the end of the time just mentioned, one of them was broken and a bone was found within it. After that ossiferous blocks of Crystalline Stalagmite were dug out frequently, and some of them were found to contain stones also.

5th. Within the compass of another month, loose round lumps of Rock-like Breccia were met with in the Cave-earth, and, from their composition and external form, were regarded as dislodged remnants of the older deposit which had so long been seen only by the mind's eye. This opinion was strengthened by the fact that the bones with which they were crowded did not appear to represent precisely the same fauna as did those met with in the Cave-earth.

6th. At the end of six additional months, the workmen came upon the old deposit of Breccia *in situ*, having all the

characters of the lumps just mentioned, but not separated from the Cave-earth above it by any Floor of Stalagmite.

7th. At the close of a further period of six weeks, or after three full years of daily research, there was found, in one and the same vertical section, the deposit of Breccia capped by its Crystalline Stalagmite, on which lay the Cave-earth, protected in its turn also, by *its* Granular Stalagmitic Floor. The early inference from the blocks of Crystalline Stalagmite alone was justified; not a link of the evidence was missing. The entire chain was presented to the eye at one view. The case was at length complete.

The following fact may be appropriately mentioned in connexion with this case. As has been already stated, a Sub-committee of the Torquay Natural History Society, in 1846, broke through the Granular Stalagmitic Floor in the South-west Chamber, and excavated the Cave-earth to the depth of 2 feet, when, having found nothing, they abandoned the work. Had they continued their labours but another half hour, had they dug but 2 inches lower, they would have entered the richly ossiferous Breccia, and, in all probability, caught sight of the earlier chapter of the history of the Cavern.

It has been already mentioned that the rock-like Breccia contained, amongst other things, considerable pieces of Crystalline Stalagmite. There can be doubt that the same interpretation applies to these as applied to those found in the Cave-earth. If the latter were correctly regarded as evidence of a Floor older than the deposit in which they were lodged—and this was found to be a fact—the former must be held to indicate the existence of a Floor still older than the Breccia—a floor of the third order of antiquity.

If the present state of the evidence be trustworthy, the Cavern, during the era of the Breccia, was almost exclusively a mausoleum, and perhaps a home, for Bears. Up to this time, no trace of *Hyæna spelæa*, *Felis spelæa*, *Elephas primigenius*, *Rhinoceros tichorhinus*, *Equus fossilis*, or of several other well-known cavern species has been found in the Breccia. Though he was subsequently their contemporary in Devonshire, the great Cave-Bear, so far as the present evidence goes, seems to have had his home there very long before them. [A few relics of Lion were subsequently found in the Breccia. See Eleventh Report below.]

The Committee have again to state that they have not yet had the good fortune to discover any remains of *Hippopotamus major* or *Machairodus latidens*, either in the Cave-earth or in the Breccia.

While it must be admitted that the labours of the past twelve months have not added anything to the kind, nor very greatly to the amount, of evidence of the antiquity of Man in Devonshire, it must also be admitted that the continued and careful researches of three and a half years have utterly failed to detect a single fact having even a remote tendency to invalidate the conclusion to which the earlier Cavern researches had led. Up to this time, the various kinds of evidence are in the most complete accord; there is nothing conflicting. No comparatively modern object has been found below its place, and no ancient one has been met with in a comparatively modern niche. The Floor of Granular Stalagmite has kept the two apart and perfectly distinct. There is nothing incongruous in the belief that the ancient Cave-Men made and used unpolished flint Implements, split the bones of animals and cut and scraped the fragments into Pins and Fish-spears, employed fire in the preparation of their food, and selected some stones for Hammers or Crushers and others to rub down the asperities on their bone tools; and this belief apparently embraces all the Cavern Anthropology which up to this time has been discovered.

The researches of the last twelve months, however, have been by no means barren or unimportant. They have, as has been pointed out, established the existence of two Chapters in the Cavern history during the times of the extinct Mammals, and have given a glimpse of a third and still earlier one; they have solved one Problem, and, in doing so, have suggested several others; and they have given an increased stimulus to research by prompting the following questions:—

1st. What were the conditions which at three different and widely separated times allowed detrital matter to be carried into the Cavern?

2nd. How was the introduction of this material suspended during, at least, two protracted periods, in which two thick floors of Stalagmite were formed?

3rd. By what agency was the Crystalline Floor partially and largely broken up? and why, where it had been removed, did it rarely leave a scar on the walls of the Cavern?

4th. What spelæan contemporaries had the Cave-bear in

the Kent's Hole Breccia? and was *Machairodus latidens* or *Hippopotamus major* amongst them?

5th. How, during the era of the Breccia, were the remains of the Cave-Bear lodged in the Cavern, seeing that none of them were rolled, broken, or gnawed, yet they lay together without the least reference to their anatomical relations?

It may be hoped that future researches may furnish solutions for at least some of these Questions.

FIFTH REPORT. Read at Exeter, August, 1869. (See *Rep. Brit. Assoc.*, 1869, pp. 189-208.)

Before commencing the Report of their researches during the last twelve months, the Committee beg to call attention to a few facts connected with portions of the Cavern explored in previous years.

In their Third Report, presented to the Association at Dundee in 1867, they stated that in a part of the Vestibule there was *beneath* the Granular Stalagmitic Floor, and generally in direct contact with its nether surface, a layer of black soil, known as the Black Band, which varied from 2 to 6 inches in thickness, covered an area of about 100 square feet, and, at its nearest approach, was 32 feet from the Northern Entrance of the Cavern. They also stated that this Black Band contained a large amount of Charcoal, that in it had been found 366 flint Implements, flakes, cores, and chips; a bone Harpoon or fish-spear, and a bone Awl; and numerous bones and teeth of extinct and recent mammals, some of them partially charred. They further remarked that were they to speculate respecting the probable interpretation of the Black Band—bearing in mind its very limited area, its position near one of the Entrances of the Cavern and within the influence of the light entering thereby, its numerous bits of charcoal and of burnt bones, its bone tools, and its very abundant, keen-edged, unworn, and brittle chips and flakes of whitened Flint,—they might be tempted to conclude that they had not only identified the Cavern as the home of an early British family, but the Vestibule as the particular apartment where they enjoyed the pleasures of their own fireside, cooked and ate their meals, and fashioned Flint nodules and bones into implements for war, for the chase, and for domestic use. (See p. 225 above.)

To the foregoing description of the Black Band and its locality, it may be added that, even during very wet seasons, the Vestibule is very little exposed to drip from the roof.

It may not be out of place to state here that, in order to

ascertain to what extent the light penetrating the adjacent Entrance of the Cavern was available, the Secretary of the Committee placed himself near the centre of the Black Band area, and found that without any artificial light he could distinctly see to write a letter and to read ordinary print.

But while the Committee have seen no reason to abandon or to modify their interpretation of the Black Band, and while it has been generally accepted by those who by personal inspection have made themselves familiar with the phenomena of the Cavern, they have found that by one very able and experienced observer it has been regarded with some amount of scepticism, on the ground that the smoke of a fire in the Cavern would either suffocate or expel the inhabitants; that, in short, the interpretation was inconsistent, since it supposed the Cavern to have been inhabited under conditions which would render it uninhabitable.

To test the force of this objection, six large faggots of wood were piled in a heap and set on fire, as nearly as possible on the centre of the area which the Black Band had occupied. The fire burnt brilliantly and threw out large tongues of flame, which licked the roof; while a party of five persons sat on the rocky sides of the Cavern and watched the experiment without the least inconvenience from smoke or any other cause. They were unanimous in the opinion that the objection thus put on its trial was utterly invalid. It may be mentioned, too, that the temperature of the Cavern is permanent, and stands by night and by day, in summer and in winter, at about 51.5° Fahr., or very near the mean annual temperature of the district in which Kent's Hole is situated. Hence it may be concluded that, unless the Black Band represents a period when the mean temperature of South Devon was considerably below that which at present obtains, large fires would not have been needed. Artificial heat would have been required, not to make the Cavern tenantable, but perhaps only for culinary purposes, and to scare beasts of prey.

Before quitting this subject, it may be stated that the smoke drifted towards the interior of the Cave, and that the Secretary, who from time to time passed all round the fire and to various distances from it, reported that in the narrower adjacent ramifications it was oppressive.

Soon after the meeting at Norwich in 1868, Mr. Boyd Dawkins, a member of the Committee, intimated his intention of visiting Torquay for the purpose of examining and naming

some of the remains of the Cave-mammals which had been collected during the exploration. It has been stated in previous Reports that from the beginning, a separate box has been appropriated to the specimens found in each distinct Yard of deposit, that is, in each paralleliped of Cave-earth a yard in length and a foot in breadth and in depth; that with each set of specimens was packed a numbered label; and that the Secretary recorded in his daily Journal full information respecting the precise position of the objects thus numerically defined, as well as the date on which they were exhumed. It may be added that, as soon as the specimens were cleaned and packed, the boxes were stowed away in a room set apart for them, the door was locked, and the Secretary never parted with the key. It is obvious that the number of boxes of specimens waiting for examination was equal to the number of "finds" which had been met with. On the 31st of December, 1868, this number was 3948; and though it is true that some of the boxes contained no more than a single bone, it is also true that in many cases there were upwards of a hundred in a box; hence it will be seen that the task Mr. Dawkins had before him possessed Herculean dimensions. When he began his examination, there must have been in store for him more than 50,000 bones; and though many of them were unidentifiable chips merely, every one had to be passed under review.

In order that this gigantic labour might be somewhat facilitated, the Secretary commenced to unpack each box, and to write on every specimen it contained the number written on the accompanying label. While thus engaged, on the 24th of September, 1868, with the box labelled 1847, he found among its contents what appeared at first to be merely a very small bone, the greater part of which was covered with a film of stalagmite. On being touched, the investment fell off (a very common occurrence in the case of similar specimens after having been washed and dried), and the object proved to be a portion of a bone Needle or Bodkin, which, having its point broken off but retaining its perfect and well-formed eye, had been concealed and, happily, protected by the calcareous covering. The remnant is about .85 inch long and slightly taper. Its section at right angles to its longest axis is sub-elliptical, resembling that of a modern bodkin rather than that of a needle. Its greater diameter at the larger end is about .075 inch, and at the smaller .05 inch; hence, assuming it to have been symmetrical in form and to have terminated in a point, its original length

must have been about 2.55 inches. There are numerous fine longitudinal striæ on its surface, suggesting that it had been scraped into form. The Secretary's daily journal shows that it was exhumed on the 4th of December, 1866, and that it belonged to the Black Band *beneath* the Granular Stalagmitic Floor. [See Evans's *Ancient Stone Implements*, fig. 408, p. 461.]

Since its discovery it has unfortunately been broken, the line of fracture passing through the eye. Before the accident it had been seen by several members of the Committee and by many other persons. The parts have been very carefully and firmly reunited. The eye was capable of carrying a thread about three-eightieths of an inch in diameter, or about the thickness of fine twine.

On November 26th, 1868, while still engaged in preparing the specimens for Mr. Boyd Dawkins, the Secretary had the good fortune to detect, under precisely similar conditions, in the box labelled 2206, a bone "Harpoon" or fish-spear, barbed on one side only. When dug out of the deposit it was in two pieces, one of which was almost, and the other completely, encrusted with stalagmite. Indeed the latter was regarded as a pipe of stalactite, and as such was preserved. It is recorded in the Secretary's journal that it was disinterred on the 7th of March, 1867, in the Vestibule, in the first or uppermost Foot-level of Cave-earth, beneath the Black Band, which was 4 inches thick, and covered with a Granular Stalagmitic Floor varying from 12 to 20 inches in thickness, and that this, again, was overlaid with Black Mould containing Romano-British and pre-Roman objects.

The fact that remains of the extinct Cave-bear, Hyæna, and Rhinoceros have been met with not only *in* the Granular Stalagmitic Floor just mentioned, but quite at its upper surface, must be borne in mind when attempting to form an estimate of the chronology of the Needle and Harpoon just described.

Besides the foregoing, there was found during the preparatory examination, in the box numbered 2067, a tooth the fang of which had been cut or otherwise reduced to a wedge-like form, and perforated obliquely as if for the purpose of being strung. It was exhumed on February 4th, 1867, in the Vestibule, in the second Foot-level of Cave-earth which is believed to have been intact; but as the overlying Granular Stalagmite had been broken up and removed by the earlier explorers, the Superintendents do not insist on the trustworthiness of its position.

The foregoing are the only objects of peculiar interest recently detected among the specimens collected by the Committee, prior to the last meeting of the Association, from the deposits beneath the Granular Stalagmitic Floor.

There have been found, however, two noteworthy objects among those which had been met with in the Black Mould overlying the Granular Stalagmite. The first is a bone Needle or Bodkin by no means so elegantly designed or so highly finished as that just described. Its proportions also are such as to secure for it great strength, and to enable it to carry a thread or cord of considerable size.

The second object is a ring, apparently of Kimmeridge Coal or some kindred substance. The diameter of the outer circle is upwards of an inch, and of the inner one about half an inch. The annulus is about $\cdot 2$ inch thick at its inner edge, and both surfaces are uniformly bevelled to a line at the outer edge. Its breadth is not uniform, as the circles are not quite concentric.

During the year which has elapsed since the Meeting at Norwich in 1868, the Committee have, with very slight modifications to be noticed hereafter, conducted the excavation on the method described in detail in their First Report.

Mr. Everett, who is about to proceed to Borneo to explore some of the caverns in that island, under the auspices of the Raja of Sarawak, spent recently two days in Kent's Hole studying the operations in detail. It may be hoped that the British Association has in this way been able to render valuable aid to the Committee who have undertaken the important work of Cavern Exploration in the far East.

The South-west Chamber continued:—In the Fourth Report the Committee stated that they were occupied in excavating that portion of the Cavern termed the South-west Chamber—the last, so far as was known, of the Chambers and Galleries which make up the Eastern Division of the Cavern, exclusive of the two Sally Ports. They added that on account of an enormous accumulation of Stalagmite it was not possible to form a correct estimate of the size of the Chamber, that it was probably much larger than had been supposed, that the only known communication between the Eastern and Western Divisions was at the opposite or north-eastern end of the Cavern, and that the Superintendents inclined to the opinion that a passage would be found opening out of the

South-west Chamber and forming a second channel of communication between the two Divisions.

Respecting the deposits, the Fourth Report stated that in the eastern part of the South-west Chamber they were :—

First, or uppermost, the Granular Stalagmitic Floor, commonly, but not invariably, of granular structure.

Second, the ordinary Cave-earth, with flint Implements and the usual Cave Mammals.

Third, the Crystalline Stalagmitic Floor, of great thickness.

Fourth, or lowest, the Rock-like Breccia, in which fragments of Grit, not derivable from the Cavern hill, were abundant; but, though replete with remains of Bear, it contained neither bones nor any other indications of *Hyæna*, *Rhinoceros*, or other prevalent Cave-earth genera.

It was added that, in proceeding westward the Cave-earth entirely "thinned out," so that the two Stalagmites, between which was its proper place, rested one immediately on the other.

Soon after the Fourth Report was presented, the Cave-earth, a few feet beyond the point where it had been lost, appeared once more in the section, resting on the Crystalline Stalagmite, and, as usual, overlaid with that which is Granular and less ancient. It proved to be merely an insulated patch in contact with the northern wall of the Chamber, extending along it for a distance of 11 feet, and having a maximum breadth and depth of 6·5 feet and 32 inches respectively. No sooner did it re-enter the section than it brought with it the characteristic Flint and Chert Implements; teeth of *Hyæna*, Mammoth, and Fox; and gnawed Bones.

Three of the Implements deserve more than a passing mention, as they are very fine specimens, belong to different types, and can scarcely be said to be exactly represented by any previously met with in the Cavern.

No. $\frac{1}{3912}$,* found 28th September, 1868, in the first Foot-level; of a dull light grey colour externally, but of an undecided black within; in form a trapezoid closely approaching a rectangle, but having the angles rounded off; about 4 inches long, 2·5 broad, and ·8 inch in greatest thickness; worked to an edge along the entire margin, and had apparently seen some service, perhaps as a scraper. With it were found part of a chert tool, a molar tooth of Bear, another of *Hyæna*, four other teeth, a gnawed bone, and

* In this fraction, the denominator, 3912, is the number of the "find," the numerator, 1, is the number of the specimen in the "find." The same rule is observed in other cases.

several small fragments of bone. [See Evans's *Ancient Stone Implements*, fig. 394, p. 453.]

No. 3918, was a white Flint Implement of porcellanous aspect, found 13th October, 1868, in the first Foot-level, rudely sub-ovoid, about 3·9 inches long, 2·5 in greatest breadth, and ·7 inch in greatest thickness, flat on one face, and, from a point near the centre of the other face, unequally fined off to an edge all round the perimeter. No object of interest occurred near it. [*Ibid.* fig. 393, p. 453.]

No. 3922, found 19th October, 1868, with several teeth of Hyæna, Fox, and Bear, in the first Foot-level, was of the same kind of Flint and aspect as No. 3918, elaborately clipped everywhere, flat on one face, and uniformly rounded on the other; in form a long, narrow, pointed, nearly symmetrical semi-ellipsoid, the principal diameters of which were 4·7 inches, 1·3 inch, and ·6 inch. [*Ibid.* fig. 390, p. 450.]

The Cave-earth containing the three tools was completely sealed with the Floor of Granular Stalagmite, which, though never quite a foot thick, was at its upper surface almost everywhere in contact with the limestone ceiling of the Chamber, and nowhere separated from it by an interspace of more than 3 or 4 inches.

The same sections, continued across the Chamber towards its southern wall, showed successively and uniformly that, beyond the patch just mentioned, they contained no Cave-earth, but were made up of one undivided huge accumulation of Stalagmite, resting on the Rock-like Breccia, and every part of which apparently belonged to the Crystalline Floor. The two, conjoined, not only filled the Chamber, but there was nothing to show how far the Stalagmite extended upwards. There was no trace of limestone visible, and the workmen had to hew their way through the two kinds of material, each more intractable than any ordinary rock, and manfully they addressed themselves to their protracted toil, feeling some gratification in the fact that every inch they advanced was so much added to what had been previously supposed the entire extent of the Cavern.

With some reluctance, it was decided, instead of breaking up the entire mass of Stalagmite, to remove the lower or basal portion of it only; to excavate the underlying Breccia to the depth of five feet instead of the usual four; in fact, to leave the upper and greater part of the Stalagmite intact overhead, and to cut a tunnel beneath it, laying bare the limestone wall of the Cavern on each side.

The Stalagmite, as well as much of the Breccia, could

only be removed with the aid of gunpowder; and considerable care and judgment were required in order that the remains of Bear which both contained, and with which the Breccia was crowded, should be as little injured as possible.

The Committee have remarked in previous Reports that, on account of its comparatively loose texture, Stalagmite is blasted with great difficulty. All, however, that the workmen had previously experienced in this way was inconsiderable in comparison with what they encountered during the last twelve months. In addition to the usual difficulties, there were others arising from the existence of cavities in the mass—one of which had a capacity of upwards of a cubic yard—into which the boring tool would unexpectedly plunge to inform the men that their labour had been in vain. Not unfrequently a hole which had been bored with great labour, and appeared to be quite satisfactory, would prove to be incapable of being fired on account of its rapidly filling with water which oozed through the Stalagmite as through a sponge.

The Crypt of Dates :—The Western Division of the Cavern, no part of which has yet been explored by the Committee, sends off branches in various directions. One of the most important tends towards the south-east; that is, towards the South-west Chamber, and leads finally into a considerable Chamber termed the "Bears' Den," which in its turn throws off several branches. One of these, opening out of the north-east corner of the Den, is a narrow *cul de sac* between almost vertical limestone walls, and occupied, from time immemorial, by a pool of water, about 20 feet long, 8 feet broad, and unknown depth. It was known as "The Water" or "The Lake," and bounded at each end by considerable accumulations of Stalagmite.

This Lake has called forth much speculation. Mr. Northmore believed the Cavern to have been a temple of Mithras, and he spoke of The Water as "the baptismal lake of '*pellucid water*.'" (*Trans. Devon. Assoc.* ii. 483.) Others have occupied themselves with guesses respecting the source whence the Lake received its supply, and the mode by which it was kept from overflowing. Some held that it was fed by a small perennial spring; others that it was replenished by the drip from the roof only; while a third party contended that there was neither waste nor supply, and that the water ebbed and flowed synchronously with the tides of the ocean!!

It is said that one adventurous visitor climbed along its northern or least precipitous side from one end to the other; but, according to the current belief, those who gained the farther end usually did so by swimming. They all are said to have brought back the report that the Cavern extended "a very little way beyond the water." Mr. MacEnery, speaking of the Lake, says, "The Cave beyond it deserves no particular notice; Admiral Sartorius and others have swam across." (*Ibid.* iii. 242.)

From the direction and length of the passages leading to them, it was obvious that the Bears' Den and Lake could not be far from the South-West Chamber. In this opinion the Superintendents were confirmed by the fact that when, from time to time, they visited the Den during the progress of the excavation of the Chamber, they heard the sound of the workmen's tools with great distinctness, and increasingly so as the work advanced, until at length their voices were heard, and ultimately conversation could be carried on. Finally, on removing the Granular Stalagmitic Floor in the north-west corner of the Chamber, where it was in contact with the limestone roof, a hole, about three inches across, and extending obliquely upwards, was disclosed in the limestone, and it was observed, through deflections of the flame of a candle, that a current of air occasionally passed through it alternately in opposite directions. The workmen were directed to enlarge the hole by breaking away the limestone, and to ascertain whither it led. As soon as it was of sufficient dimensions, the younger workman, John Farr, ascended through it, and after a short time returned, stating that from the hole he entered a somewhat tortuous tunnel, having an easterly direction through the limestone, and so narrow and low that it could only be traversed by lying prostrate, and adopting a vermicular motion; that after a few feet he entered a small gallery in which it was possible to turn round, and, in some places, to stand erect; that this gallery had a north and south direction, extending both ways a few feet only beyond the point at which he had entered it; that the inner or northern end was closed with Stalagmite, on which he observed "writing," and that it terminated southward on the end of the Lake most remote from the Bears' Den.

Farr's report induced the foreman, George Smerdon, and the Secretary, to follow his steps, when they found his description to be correct in all respects. It was further observed that the Floor of the north and south gallery was entirely composed of Stalagmite, was, in fact, the upper sur-

face of the mass beneath which the workmen had begun to tunnel, and the greater part of which, on account of its enormous thickness and its intractability, they had reluctantly been directed to leave intact. At the inner end this Floor rose in the form of a steep irregular talus, on which, as well as on the walls, was the "writing" of which John Farr had spoken. This proved to be a series of initials and dates, amounting probably to upwards of a hundred, inscribed on the Stalagmite. Among the Dates were 1744, 1728, 1702, and 1618. In several cases the scribes cut the figure of a square, and inscribed their initials within it. On account of the inscriptions this gallery has received the name of "The Crypt of Dates."

In looking at those Dates, it seems impossible to abstain from reflecting on the facts that they are cut on the upper surface of a mass of Stalagmite upwards of twelve feet thick, in a locality where the drip is unusually copious; and that two and a half centuries have failed to precipitate an amount of calcareous matter sufficient to obliterate incisions which at first were probably not more than an eighth of an inch in depth.

It is scarcely necessary to observe that if the Stalagmite had been entirely broken up, as was at first intended, the Inscriptions would have been destroyed with it; or that the discovery of them confirmed the decision to remove no more of its nether surface than would suffice to give the workmen sufficient height for their labour.

The Lake:—As the workmen advanced steadily towards the south-west, every step rendered it more and more probable that a passage might be laid open, leading out of the South-west Chamber in the precise direction of the Lake, and thus furnished an additional motive for tunnelling beneath the Floor, in order that the Lake-basin might be preserved.

The removal of the Breccia, and of that part of the Stalagmite immediately above it, disclosed the fact, with which, indeed, the Superintendents were already familiar, that Stalagmite was by no means impervious to water. Increased proximity to the Lake rendered this not only more and more patent, but augmented the difficulty of blasting the mass, and caused the labour to be one of great discomfort. It was therefore found necessary to tap the Lake and allow the water to escape. As soon as it was sufficiently dry, the workmen were directed to remove and examine carefully such deposits as might be found lying on the Stalagmitic Floor of the

basin. They proved to be, first, or uppermost, the Floor of Granular Stalagmite; second, the ordinary Cave-earth, beneath which was the Crystalline Stalagmite of great thickness.

The Granular Stalagmitic Floor, overlying the Cave-earth, was from 10 to 12 inches thick. It was finely laminated, and soil-stained throughout; but, except at the ends of the basin and along its northern side, where portions of it remained *in situ* in a coherent but brittle condition, it was everywhere resolved into an almost impalpable paste, which, on being subjected to hydrochloric acid, rapidly effervesced and left very little residuum. A heap of this paste, thrown outside the Cavern, hardened into a coherent mass on exposure to the weather.

In this pulpy mass were found numerous objects, none of which were of much interest, as the following list shows:—

1. Extemporised wooden candlesticks, such as were commonly used by those who visited the Cavern.
2. Pieces of candle.
3. Stems and bowls of clay smoking-pipes, one of the former being unusually large.
4. Bottles of various kinds—wine, lemonade, and ginger-beer; some entire, but most of them broken.
5. Wine and other glasses, all broken.
6. Fragments of earthenware and china cups.
7. Numerous sticks and branches of trees; many of them charred.
8. A tin scone.
9. A small iron claw-hammer.
10. The handle of a hammer.
11. A clasp-knife, shut.
12. A two-foot rule, closed.
13. The plate of a child's iron spade.
14. A wooden ink-bottle (?).
15. An oyster-shell.
16. A pecten-shell, apparently used to hold some kind of paint.
17. A wooden spatula.
18. A wooden tally, having the initials W. R. cut on it.
19. A well-squared block of wood, above 5 inches long and broad, and 2·75 inches thick.
20. A wooden cover of a salting-pan, or of a small furnace.
21. A portion of a stout iron chain, 44 inches long, consisting of twenty-four links with a swivel, and having a padlock at one end.

22. Numerous broken stalactites, pap-like stalagmites, pebbles, and blocks of limestone.

Many of the objects (such as the candles, candlesticks, bottles, glasses, &c.) presented no difficulty. They were, no doubt, thrown into the Lake in frolic, or by those who did not care to carry them farther after they had ceased to be of service. Others (such as the knife, foot-rule, hammer, &c.) were probably dropped unintentionally; and the cover of a salting-pan or furnace, as well as the block of wood, may have been used by the curious to float candles. It does not seem easy, however, to account for the chain. It is not an object likely to have been useful during visits to the Cavern, nor is it an article such as people commonly carry about with them. The pebbles were thrown in, perhaps, in order to the formation of an opinion respecting the depth of the water; and the larger stones probably for the same purpose, or perhaps in the hope of using them as stepping-stones by those who desired to traverse the Lake.

It is, perhaps, worthy of remark that there were in the Lake no mediæval or ancient objects; nor any such as might have been cast in as votive offerings by people who regarded the water with religious veneration.

Mr. Mac Enery seems to have believed that there were probably objects of interest in the Lake; he says, "We ought to rake it out." (*Trans. Devon. Assoc.* iii. 242.)

In the Cave-earth in the Lake there were found a fragment of an Elephant's jaw containing a perfect molar tooth (No. 3963), the finest specimen of the kind with which the labours of the Committee have been hitherto rewarded; a molar of a Horse; several more or less perfect bones, including a humerus, an ulna, a scapula, and radii; and a fragment of a large horn-core.

That the Lake was supplied with water by infiltrations through the roof and walls exclusively there is now no manner of doubt, and that some portion of it oozed away through the Stalagmite composing the bottom of the basin is no less certain. The mechanism, however, which rendered it impossible for the Lake to be so filled as to overflow into the Bears' Den was, on examination, very patent and interesting. In its right wall (as one enters it from the Bears' Den), which is almost naked limestone, there is a natural tunnel or water-course, about 30 inches high and 20 inches wide, the base of which, at its junction with the Lake, is 11 inches below the highest level to which the water could rise, and forms an ascensive inclined plane from the Lake into the wall, having

an inclination of 3° , and a length of about 3.5 feet. Beyond this point the inclination is in the opposite direction, and much greater. Beyond a distance of 18 feet its course has not been traced, but it seems to ramify in various directions through the limestone. At the common vertex of the two planes, a vertical diaphragm of stalagmite, about 9 inches high and something more than 1 inch thick, extends quite across the tunnel from wall to wall, having its upper edge sensibly horizontal, and leaving above it a free open passage several inches high. It is obvious that whenever the water attained to this level the Lake was full, and that the surplus flowed over the diaphragm, or natural weir, of stalagmite. The fact that this regulated the maximum level of the water is confirmed by a corresponding and strongly marked high-water line along the entire boundary of the Lake. It is equally evident that unless there had been some other means of escape, this height, once reached, would have been permanent. During protracted droughts, however, the water has been known to fall upwards of 2 feet below this level—a fact accounted for by the slow oozing of the water through the Stalagmitic bottom.

The entire circumference of the Lake, and especially the almost vertical limestone wall on the right, or south, side is thickly studded with coralloidal tubercles of Arragonite of various sizes, extending from the high-water to the low-water line. Indeed, they extend quite to the bottom of the Lake, but are less abundant than in the zone just mentioned.

Many parts of the Cavern present phenomena and problems of interest to the physicist as well as to the anthropologist and palæontologist. Thus, to go no further than the Lake, there are:—first, the facts that, at one period, the water entering through the limestone roof formed a floor by precipitating carbonate of lime, and that subsequently water, finding access through the same channel and lodging on this very floor, was capable of dissolving it and reducing it to a mere paste, apparently as calcareous as when it was in the coherent condition; second, that during the work of destruction, coralloidal masses of Arragonite were formed on the naked limestone and Crystalline Stalagmitic walls, but chiefly on the former; third, that the water had slowly increased the capacity of the Lake, by building a weir of Stalagmite entirely across the narrow tunnel which formed its principal outlet; and, fourth, that had time been allowed, this latter process must ultimately have closed that outlet and entirely changed the direction of the drainage of the Lake.

From the inscriptions in it, the number of persons who, from time to time, visited the Crypt of Dates, must have been very great ; and every one of them must have taken the same route, namely, along the entire length of the Lake. The earliest known mention of the water is that by Polwhele (*Hist. Devon.* 1797, i. 50-51), when its condition appears to have been identical with that in which the Committee found it. Assuming it to have existed, and in the same state when the inscriptions were cut, the scribes must have performed the journey by wading through it, by using a float, by climbing along its almost precipitous northern wall, or by swimming. The last is perhaps the most probable mode ; but in either case they must have provided themselves with the requisite tools and with an adequate supply of candles. In some cases the work appears to have consumed a considerable amount of time. If, however, it be supposed that at least most of the Inscriptions belong to the time when the Granular Stalagmitic Floor of the Lake was yet undissolved, much of the difficulty will disappear, as wading would then have been easy ; the Stalagmite would have afforded firm footing, and the depth of the water would not have been very considerable, even if permanently at the overflowing level, and the weir had been as high as it is at present.

The Water Gallery.—Having completed the excavation of the Lake, the workmen resumed their tunnelling operations in the passage leading out of the South-west Chamber in a south-westerly direction, and which, as had been anticipated, was found to extend beneath the floor of the Lake-basin and along its entire length. To this passage it is proposed to give the name of the "Water Gallery ;" and probably no part of the Cavern yet explored surpasses it in interest or importance.

As might have been expected, the deposit it contained was made up of the same materials as were found everywhere else beneath the Floor of Crystalline Stalagmite—dark red sandy earth ; subangular and rounded pieces of Grit not derivable from the Cavern hill, but which the neighbouring and loftier Lincombe and Warberry hills could supply ; a few angular pieces of Limestone, and pieces of Stalagmite (some of them of great size), which, of course, were remnants of a Floor more ancient still than the Crystalline Floor which lay *above* the Breccia and below the Cave-earth. The points in which the Breccia differed from the Cave-earth were chiefly the darker colour of the red soil forming its staple, and the very much greater prevalence of fragments of Grit. By the latter

character alone it was very easy to distinguish the materials of the two deposits when thrown into the huge mass of refuse which the workmen lodged outside the Cavern, especially after exposure to a shower of rain. Many of the pieces of Grit, both subangular and rounded, were of a very dark colour, and some of them had a polished metallic aspect, somewhat like that of a black-leaded hearthstone. The removal of the smallest splinter, however, showed that both colour and polish were only superficial.

Along a considerable part of the length and breadth of the Water Gallery the Breccia, instead of being in contact with the nether surface of the Crystalline Stalagmitic Floor which formed the bottom of the Lake, was separated from it by a vacuity, or interspace, sometimes 14 inches deep. It may be described as a rudely lenticular space, as it was of greatest depth in the middle, and, if the phrase be applicable to space, thinned off in every direction. A correct idea of the complete insulation of this vacuity may be conveyed by stating that if any animal, however small, could have become its occupant it would have been a permanent prisoner unless it could have excavated for itself a passage by which to escape.

Here and there, moreover, the vacuity was interrupted by what may be called pillar-like "outliers" of Breccia, which reached, and were firmly adherent to, the Stalagmite above. In every other part, the ceiling, or lower surface of the Stalagmite, retained traces of the deposit which had once been in contact with it, and on which, indeed, it had been formed. To it there clung angular and rounded pieces of rock, blocks of still *Older* Stalagmite, and bones, teeth, and almost entire skulls of Bear; whilst between them, in the ceiling, were the cavities once filled by similar objects, but which having fallen out were found on the surface of the Breccia beneath. From the ceiling, too, there shot downwards numerous thin pipes of stalactite, of the thickness and colour of goose-quills, some of which reached the Breccia. The surface of the latter deposit beneath was here and there covered with patches of recent stalagmite, occasionally incorporating pipes of stalactite, such as have been just mentioned, which by some means had been broken off. In fact a modern Floor of Stalagmite was in process of formation, vertically beneath the old one, by the agency of water filtering through the latter, and carrying with it the requisite calcareous matter.

As nothing would have been gained by their removal, the objects just described were left adhering to the ceiling—a fact

which induces visitors to regard the Water Gallery as one of the most attractive branches of the Cavern.

All that portion of the Breccia which was not more than about a foot from its upper surface, and about a yard from the south wall of the Gallery, was invariably cemented into a firm rock-like concrete, but at all lower levels, and at greater distances from the south wall, it was perfectly incoherent. Where it was cemented it was crowded with fossils, but where it was not, there were few or none. The former was its almost uniform condition in the adjacent South-west Chamber and Lecture Hall, where fossils formed a very large percentage of the entire mass.

The problem of the severance of the Breccia from the Stalagmite, resulting in the vacuity mentioned above, closely occupied the attention of the Superintendents whilst the excavation of the Water Gallery was in progress. There appear, *à priori*, to be three possible solutions,—first, that a stream of water had insinuated itself between the deposit and the floor, and had carried off the detritus which once filled the interspace; second, that, through failure of support at the base, the Breccia had sunk away from the Stalagmite to a slightly lower level; and, third, that water passing slowly through the Stalagmite had carried the finer particles of the detritus from the top of the Breccia to lower levels, lodging a portion of them in such interstices as it encountered, and perhaps carrying off the residue as colouring-matter.

The first is met by the fatal objection that there is no channel, large or small, either of ingress or egress, for the hypothetical stream, or the matter it is supposed to have removed.

Since the vacuity was both partial and discontinuous, the second suggested solution requires that the supposed failure at the base should have had these same characters, and hence that the Breccia should have been faulted. To this latter point the closest attention was given from first to last, and no trace of anything like a fault was ever detected. [Moreover, the pillar-like outliers just mentioned negative completely the hypothesis of subsidence.]

The third hypothesis presupposes that both the Stalagmite and the Breccia are permeable by water. On neither of these points is there any doubt. Water has been seen oozing through this very Stalagmite, and it is well known that pools which in wet weather are formed on the Breccia disappear in a short time on the cessation of the drip. Indeed, when the

Lake was tapped the water was led to a depression in the surface of the Breccia in the South-west Chamber, and in less than a week the greater part of it had disappeared. There can be little, or no, doubt that the third is the true solution of the problem of the vacuity between the Crystalline Stalagmite and the underlying Breccia in the Water Gallery.

The animal remains found in that part of the Cavern at present under notice were, so far as is known, exclusively those of Bear; and many of them were fine specimens, including some splendid canines and molars. Many of the bones were found broken, and some of them had certainly been fractured where they lay, as the parts remained in juxtaposition and, indeed, were reunited by some natural cement. When first exhumed, many of them were so impressible that in cleaning them it was found that a soft brush left its traces on their surfaces. Exposure to the air hardened them. Some of the canines had obviously seen considerable service. Many of the molars were beautifully white, and it was rarely possible to detect any evidence of wear on them. This latter fact was noticed by Mr. Mac Enery when speaking of the Bears' molars found in a similar deposit in the adjacent Bears' Den; and was supposed by him to "intimate that the Bears of those days were less exclusively frugivorous than the modern species, and lived partly on flesh." (*Trans. Devon. Assoc.* iii. 366.)

In their Fourth Report the Committee, speaking of the deposit under the Crystalline Stalagmite, remarked, "Up to this time the Breccia has been utterly silent on the question of the existence of Man; it has given up no Tools or chips of Flint or Bone, no Charred wood or bones, no bones split longitudinally, no stones suggesting that they had been used as Hammers or Crushers. But while they have before them the lessons so emphatically taught by their exploration of the Cavern, the Committee cannot but think that it would be premature to draw at present any inference from this negative fact." (See pp. 240-1 above.)

The cautiousness inculcated in this passage received its justification on March 5th, 1869, when a Flint flake (No. 3991) was discovered in the Breccia in the Water Gallery. The particulars of this discovery were forwarded to Sir Charles Lyell, Chairman of the Committee, by the Superintendents, in the following passage in their Monthly Report, dated 8th April, 1869:—"It was found with portions of the teeth of the Cave-bear, lying on a loose block of limestone, in contact with the north wall of the Gallery, in the third Foot-level;

that is, from 2 to 3 feet below the surface of the Breccia. A section at right angles to its longest axis would be a scalene triangle. The face of the flake represented by the smallest side is the natural surface of the Flint nodule from which the specimen was struck. It required no more than three or, at most, four blows to produce it. On its larger face the 'bulb of percussion' is well pronounced. It is partially coated with a thin ferruginous film occasionally dendritic, and resembling that which . . . commonly coats the pebbles found in the Breccia. Beneath this partial envelope it is of a light buff-colour. Its aspect is unlike that of any implements or flakes found in the Cave-earth. None of its edges can be said to be keen, yet it does not appear to have been rolled. One well-rolled small Flint pebble occurred in the Breccia, also in the Water Gallery.

"Though the flake cannot be regarded as a *fine* specimen, we think there is little or no doubt that it was formed by human agency, and assuming this to be the case, it appears to us to be of very great value, as it was found in a deposit not only older than the ordinary implement-bearing Cave-earth, but separated from it by the Crystalline Stalagmitic Floor, which in some cases was 12 feet thick, and which is certainly of great thickness immediately above the spot where the flake lay. In fact, it was found in a deposit which, so far as the Cave evidence goes, was laid down before the introduction of that in which were entombed the first traces of the Cave-hyæna, Cave-lion, Mammoth, and their contemporaries. [Relics of Lion were subsequently found elsewhere in the Breccia.]

"Being impressed with the probably great importance of the discovery, we carefully addressed ourselves to the question, 'Did the flake originally belong to the comparatively modern Cave-earth in the Lake above, and find its way through some crevice in the Crystalline Stalagmitic Floor which forms the ceiling of the Gallery?' To this important question we are prepared to give a negative reply; for—

"1st. No crevice or hole of any kind is discoverable in either the upper or lower surface of the ceiling of Crystalline Stalagmite.

"2nd. The flake was not found vertically beneath any part of the Lake, but fully a yard beyond its nearest margin.

"3rd. It did not lie on the surface of the deposit, but from 2 to 3 feet beneath it.

"4th. If the flake were originally lodged in the Cave-earth found in the Lake, it must have been the only one deposited

there; for when we carefully and completely emptied the Lake no Flint implement or flake was met with in it.

"5th. If the flake had found its way through the Stalagmite, it might have been expected that some such bones as were found in the Lake—those of Horse and Mammoth, for example—would have descended through the same crevice; but instead of this, the remains of the Bears were alone met with in the Breccia, and Ursine teeth were found in contact with the flake itself.

"In short, there is no crevice through which the object could have passed; if it descended through the Floor, it descended alone; and if it did so descend, it ought not to have been where it was found. We have no hesitation in stating that the flake is of the same age as the Breccia which contained it; and that if our opinion of its Human origin be confirmed, it is anthropologically by far the most important object the Cavern has yielded."

On June 3rd, 1869, the flake was submitted to Mr. John Evans, F.R.S., a Member of the Committee. He drew up the following statement, with the intention that it should be inserted in the present Report:—"No. 3991 is undoubtedly of human workmanship. It is a flake of flint from the Chalk, one of the smaller facets of which shows the natural crust of the nodule from which it was struck. The other external facet shows the characteristic depression arising from the bulb of percussion on the flake previously removed to form this facet. The flat or internal face of the flake shows a well-developed bulb, and the large butt-end where the blow was struck has been fashioned by two or three blows. It has therefore taken four or five blows, each administered with a purpose in view, to produce this instrument.

"Not only, however, has it been artificially made, but it carries upon it evidence of having been in use as a tool; for the edge produced by the intersection of the two principal artificial faces is worn away along its entire length, and exhibits the slightly jagged appearance produced by the breaking off of the sharp edge, such as I find by experience to result from scraping bone or other hard substances with the edge of a flint flake."

(Signed) "JOHN EVANS, June 3rd, 1869."

Besides the above, a small perfectly angular piece of coarse-grained white Flint (No. 4037*a*) was discovered in the first Foot-level of the Breccia in the Water Gallery, on Friday, April 23rd, 1869. It has the aspect of having been struck off in making an implement.

Having ascertained by careful measurements that a very few feet would take the workmen into the Bears' Den, and thus open a second communication between the Eastern and Western Divisions of the Cavern, it was decided to excavate the Water Gallery no farther, as it was deemed undesirable to commence the investigation of the Western Division of the Cavern so long as any branch of the Eastern Division remained unexplored.

The South Sally-Port.—On the suspension of the excavation in the Water Gallery, the exploration of the South Sally-Port, opening out of the Lecture Hall (see p. 216 above), was commenced, and at present has been completed to upwards of 40 feet from its entrance.

For the first 15 feet there was the ordinary Granular Stalagmitic Floor overlying the typical Cave-earth, but beyond that point there was no Stalagmite, except a thin and very limited patch in one or two places. At the junction with the Lecture Hall the floor was 21 inches thick, but it became rapidly thinner as it extended into the Sally-Port, and for some feet it did not exceed an inch in thickness.

No part of the Cavern is at present less than this exposed to drip. It may not be out of place to state here, as a fact of at least, large generality, and to which there is at present no known exception, that in those portions of the Cavern where the drip is at present very copious the Stalagmitic Floor is of great thickness; and where the drip is but little, there is either no Floor or an extremely thin one; that, in short, the present amount of drip in any locality affords a good index of the thickness of the Floor there, so that the lines of drainage of the Cavern hill appear to have undergone no change for a very lengthened period.

The South Sally-Port presented phenomena having no parallel in the experience of the Committee during the present exploration, but for which Mr. MacEnery's *Cavern Researches* had prepared them. Speaking of the Sally-Ports, or "Long Tongues," he says, "Their entire area is honey-combed with fox-holes, and the loam thrown up in mounds round their edges is mixed with scales of the beetle, modern and fossil bones, all of which, as well as the rocky contents, resembled bleached or calcined substances exposed on a common." Indeed his description of the South Sally-Port is not very encouraging; for, he continues, "In attempting to reach the extremity of the lower tongue at a point where it suddenly expands into a large grotto, the hollow floor gave

way like a pitfall with my weight, and sank into a cleft of the rock. I shall not dissemble my terror at my sudden descent. My efforts to escape would but cause the ground to sink still deeper and deeper into deeper abysses.

* * * * *

"The crash routed some animals from their subterranean abodes. I heard them forcing their escape towards the outside through the incumbent earth, and perceived their foot-marks. The hounds frequently assemble outside about this point, and frequently earth foxes there." (*Trans. Devon. Assoc.* iii., 302.)

Happily none of the present exploring party have experienced any inconvenience during their researches in this Sally-Port; but they are constantly meeting with tunnels in the Cave-earth probably made by some burrowing animals; with ancient and modern bones commingled both on the surface and at all depths below it; with great clusters of the wing-cases of beetles exclusively on or very near the surface; and they have had impressed on them daily the important but familiar truth that unless sealed up with a Stalagmitic Floor, and free from animal burrows, Cavern deposits are just as likely to be fraught with anachronisms as with a trustworthy chronological sequence.

In the South Sally-Port, the Black Mould, which in most other parts of the Eastern Division of the Cavern was found continuously overlying the Floor of Granular Stalagmite, did not extend many feet within the entrance. Beyond the point at which the Stalagmite ended, up to the point at present reached, the entire deposit was Cave-earth from top to bottom of the sections. In previous Reports the Committee have recorded the fact that in the Granular Stalagmite itself were lodged remains of various species of Mammals, including the Cave-bear, Hyæna, and Rhinoceros, as well as existing forms. Indeed, the only fossil found in the scanty Floor of Stalagmite in the branch of the Cavern now under consideration was a tooth of Rhinoceros (No. 4090), found 27th May, 1869, which was not only in quite the upper part of the Stalagmite, but, instead of being completely covered, projected above its surface. Obviously, then, *Ursus spelæus*, *Hyæna spelæa*, and *Rhinoceros tichorhinus* outlived the Cave-earth era, and therefore it would not be surprising if their remains, together with palæolithic Flint Implements, were found on the naked surface of the Cave-earth; nor, under the circumstances supposed, would there

be anything inexplicable or strange if they were found mixed with objects belonging to more recent periods, or even to the present day. Such a commingling might or might not be the result of disturbance when occurring on the surface, but would admit of no other explanation if met with below.

Be this as it may, it is undeniable that in the South Sally-Port ancient and modern bones, unpolished Flint Implements and rude Pottery have been found lying together. Remains of extinct brute inhabitants of Devonshire were mixed confusedly with those of the present day, and the handiwork of the Human contemporary of the Mammoth was found inosculating with the products of the Potter's wheel.

It is worthy of remark that while potsherds lay on the surface, and the mouths of shafts connected with tunnels or burrows stood open to receive them, instances of their having fallen in were extremely rare. The modern objects found in the Cave-earth were almost without exception such as had been actually taken in by recent animals which made their homes there. In a sensibly-horizontal tunnel about the size of a "fox-earth," there was found, 4 feet below the surface, 26th July, 1869, a bell (No. 4327), such as huntsmen are wont to suspend from the neck of a terrier when sent in after a fox—a fact which probably explains its presence in the spot it occupied. In other and smaller burrows, bundles of moss, each about the size of a man's fist, and supposed to be the nests of some animals, were occasionally found.

Compared with the phenomena of every other branch of the Cavern hitherto explored by the Committee, those of this Sally-Port were no doubt anomalous; but, regard being had to the condition of the deposit, they are certainly such as might have been looked for, and present no difficulty whatever.

Notwithstanding the obvious disturbance of the Cave-earth, the same method of exploration was followed here as elsewhere; and the specimens found in each Level and Yard were kept apart in separate boxes as heretofore.

Scarcely any branch of the Cavern surpassed this Sally-Port in the number of the fossils it yielded, and in no part have finer or more perfect specimens been found. They are the remains of all the common Cave Mammals, with a greater number of the teeth of the Mammoth than have been met with by the Committee within an equal space elsewhere. The bones were generally of less specific gravity, softer, and more brittle than those found in the Cave-earth in other parts of

the Cavern—a fact perhaps ascribable to the absence or paucity of calcareous drip. Many of them were gnawed, some had entirely escaped this ordeal, and a few had marks on their surfaces apparently unlike those produced by teeth. Most of them on being cleaned retained impressions of the brush used for that purpose. The surfaces of several were more or less covered with rudely circular punctures of various sizes—a fact observed occasionally in those found elsewhere, but much less frequently than in these in this Sally-Port. Lumps of faecal matter were by no means rare.

The Flint and Chert Implements and flakes were ten in number, three of which were met with on the surface, one in the first Foot-level, three in the second, two in the third, and one the position of which is somewhat uncertain. Four only need be described.

No. 4155, a splendid heart-shaped Chert Implement, found 12th June, 1869, on the surface of the Cave-earth where there was no Stalagmite, beneath an overhanging ledge of Limestone which it almost touched, on the right or west side of the Sally-Port. It was made from a pebble apparently taken from the Supracretaceous gravel of Milber Down between Torquay and Newton Abbot, and measured 4.25 inches long, 3 inches in greatest breadth, 1.75 inch in greatest thickness at 1.25 inch from the butt-end, which alone retained the original surface of the pebble. No such Implement had been previously found by the Committee, nor do any of those figured by Mr. Mac Enery at all resemble it. [Nothing like it was subsequently found by the Committee. See Evans's *Ancient Stone Implements*, fig. 388, p. 448.]

No. 4259 was of fine-grained silvery-grey Flint, symmetrically canoe-shaped, 3.6 inches long, 1.2 inch in greatest breadth, .4 inch in greatest thickness, flat on one side, somewhat rounded on the other, worked to an edge all round the margin, and considerably chipped or dressed on both surfaces. It was found 5th July, 1869, on the Cave-earth without any Stalagmite over it.

No. 4263, formed of coarse white cherty Flint, flat on the inner surface, carinated on the outer, not highly finished, about 4 inches long, 1.3 inch broad, .6 inch in greatest thickness, was found 6th July, 1869, in the second Foot-level of undisturbed Cave-earth, without any overlying Stalagmite.

The fourth Implement was strongly carinated on the outer face, while the inner was very concave longitudinally and slightly convex transversely. It was 3.4 inches long, 1.2 inch broad, .5 inch in greatest thickness, and chiefly remarkable on

account of having a square tang at one end as if for being hafted. The opposite end was rounded, while the lateral margins were fined off to an edge. It was found 5th August, 1869, at 40 feet from the entrance of the Sally Port, in a small mass of Cave-earth which, without being observed, slipped off the face of the section; hence its exact position was uncertain.

Charcoal was found somewhat plentifully on the surface of the Cave-earth, where a few burnt bones occurred with it. It was also met with at all depths in the Cave-earth, though in no great quantity.

A few marine shells of common species were met with on the surface.

The fragments of Pottery differed in colour and in finish, and probably belonged to more than one period. Two or three of them were rather larger than those commonly found in the Cavern.

Report by Mr. W. Boyd Dawkins, M.A., F.R.S.

During the last twelve months Mr. Boyd Dawkins, a member of the Committee, assisted by Mr. Ayshford Sanford, having made considerable progress in identifying and naming the fossils, has prepared and sent in a Catalogue of a large number of specimens, accompanied by the following Report:—

In the determination of the following animals from Kent's Hole Cavern, I have been aided by my friend Mr. Ayshford Sanford. By far the greater portion of the labour has been undergone by him. We have examined upwards of four thousand specimens, or rather less than one-tenth of the whole accumulation of the remains in the hands of the Committee. No bones of birds or fish have been catalogued; the latter Dr. Günther has kindly undertaken to name before our Report is concluded. The results of our work are contained in the following catalogue.

Homo.—We have met with no bones or teeth from the Cave-earth that can be ascribed undoubtedly to man. One or two much-worn or mutilated incisors, however, may be human, but they may also belong to several other animals. The human remains from the prehistoric deposit of Black Mould are exceedingly abundant, and many of them, in Mr. Sanford's opinion, bear evidence of the former existence of cannibals in the Cave. Some of them have been cut and scraped by sharp instruments, the marrow-bones are broken, and are mixed indiscriminately with the broken bones of Sheep or Goat, Red Deer, *Bos longifrons*, and other animals.

In one box there are the remains of at least three individuals—a large man, a nearly full-grown woman or lad, and a child about half-grown.

Man has also left his handiwork on some very remarkable fragments of canines of Bear from the Cave-earth, which, in common with many other splinters of bone, are in a totally different mineral condition to that presented by the ordinary Cave-remains. They are much more Crystalline, much heavier, and of a darker colour than the ordinary teeth and bones, and have been so mineralized that they present a fracture almost conchoidal, and strongly resembling that of a Greensand chert. One of these had been fashioned into a flake, and one of its surfaces presented the usual traces of use. It had manifestly been formed after it had lost its normal dentinal texture. It is clear, therefore, that they had become fossilized before the introduction of the present Cave-earth. Viewed in connexion with the evidence of the existence of an ancient floor that is now represented by masses of Stalagmite, sometimes ossiferous, we cannot resist the idea that they are samples of the contents of the Cave which had in the main disappeared before the introduction of the present Cave-earth.

Felis spelæa.—The Cave-lion is tolerably abundant in the Cave-earth.

Felis, sp.?—A single canine from the Cave-earth indicates an animal of the size of *Lynx cervaria*.

Felis catus?—A lumbar vertebra from the Cave-earth corresponds in size with that of the Wild Cat.

Hycæna spelæa.—The Cave-hyæna is very abundant in the Cave-earth.

Canis lupus.—The Wolf, on the other hand, is comparatively rare.

Canis domesticus.—The remains of the Dog are sparingly met with in the Black Mould, and indicate the presence of more than one variety.

Canis vulpes.—The Common Fox is found in the Black Mould, and sparingly in the older subjacent deposit.

Canis vulpes (var. *spelæus*).—Vulpine bones, on the other hand, from the Stalagmite and Cave-earth indicate an animal larger and stouter than the English Fox. These are not found in the Black Mould.

Canis (size of *C. isatis*).—With the larger bones there are a few much smaller than those of the Common Fox, that correspond most closely with those of *C. isatis*. The vulpine skulls, however, in the Taunton Museum, from the Mendip

Caves, rather indicate a species closely related to *C. isatis* than a specific identity, since the true molars are somewhat broader. It is well to mention that Mr. Sanford has identified a portion of a skull found along with the remains of *Hyæna*, in a cave on the opposite side of Torbay, as belonging to *Canis isatis*.

Gulo luscus.—A single os innominatum of a nearly full-grown Glutton indicates the presence of this rare mammal in the Cave-earth. Although it belonged to an animal not quite adult, it agrees almost exactly in size with that of a fully grown male from Sweden.

Meles taxus.—The remains of the Badger are abundant in the prehistoric Black Mould, rare in the Cave-earth. In the latter case we doubt the truly fossil condition of the bones.

Ursus spelæus.—The bones and teeth of the Cave-bear from the Cave-earth indicate greater variation of size than those of any other wild animal with which we are acquainted.

Ursus priscus = *ferox*.—This species, which has been proved by Mr. Busk to be undistinguishable from those of the North-American Grizzly Bear, occurs abundantly in the Cave-earth, as it does also in the caves of the Mendip Hills. The short stout bones of *U. spelæus* are represented by flatter, longer bones of *U. ferox*, that are for the most part distinct from the rounder bones of *U. arctos*. We therefore have attributed the isolated flat long bones to the second of these species. Bones of intermediate form, however, occur which appear to connect the two forms. They are more constant in size than those of the other two bears.

Ursus arctos.—Teeth and bones of the Brown Bear, still living in Europe, occur, but not very commonly, in the Cave-earth. Some of those from the Black Mould are evidently derived from the lower and older beds; but others, from their condition, apparently belong to animals that lived at the same time as *Bos longifrons* and the Sheep or Goat of the Black Mould.

Elephas primigenius.—The Mammoth is but sparingly met with in the Cave-earth.

Rhinoceros tichorhinus.—The remains of the Woolly Rhinoceros are abundant in the Cave-earth.

Equus caballus.—The Horse is the most abundant fossil in the Cave-earth. Many of the teeth are more or less plicident, but we are unable to draw any sharp line separating the *Equus plicidens* of Prof. Owen from the recent species. They present almost endless variations in this respect, and were

apparently in a state of transition from the plicident to the common type in the postglacial times.

Bos primigenius.—The Urus exists somewhat sparingly in the Cave-earth.

Bison priscus.—The Bison, on the contrary, is much more common in the same deposit.

Bos longifrons.—Bones and teeth of the Celtic Shorthorn occur in the Black Mould. The small bones in the Cave-earth belong to the preceding species.

Cervus megaceros.—The Irish Elk is not uncommon in the Cave-earth.

Cervus elaphus (= *Strongyloceros spelæus*, Owen = *C. destremii*, Serres).—We have come to the conclusion that the Red Deer was more variable in size during the postglacial period than at the present day. Some teeth are not larger than those of a small hind from the Hebrides, while others surpass in size those of the largest Haddon or Horner Hart. Some even almost rival those of the smaller specimens of the Irish Elk. The animal occurs both in the superficial Black Mould and in the Cave-earth.

Cervus tarandus.—The Reindeer is abundant in the Cave-earth.

Cervus capreolus.—We have met with the Roedeer only in the Black Mould; it was evidently a common article of food.

Ovis aries, *Capra hircus*.—The Sheep and the Goat are abundant in the Black Mould.

Sus scrofa.—The Pig occurs in the Black Mould only; it is small in size, and was evidently an article of food.

Lepus timidus.—The remains of the common Hare are abundant in the Black Mould, but are rare in the Cave-earth and Stalagmite. In these deposits they are for the most part replaced by larger and stouter bones, which may perhaps be referred to *Lepus diluvianus* of the French naturalists. These stout bones are very rare in the Black Mould.

Lepus cuniculus.—Bones of the Rabbit are abundant in the Black Mould; a single bone has occurred apparently from the Modern Stalagmite, but none from the Cave-earth.

Lagomys spelæus.—We have met in the Cave-earth with a lower jaw of the Cave Pika. It is rather smaller than the type, and is closely related to that of *Lagomys pusillus*.

Arvicola amphibius.—The Water-rat, or one of the closely allied varieties, we have met with, but not abundantly, in the Cave-earth and Black Mould.

Arvicola agrestis.—There are one or two specimens from the Cave-earth of this species that show the same variation

in the direction of *A. ratticeps* which Mr. Sanford has remarked in jaws from the Mendip Caves.

Arvicola glareola (= *A. pratensis*).—We have met with a single lower jaw from the Cave-earth.

Arvicola guillemi.—This new species of Vole, discovered lately by Mr. Sanford in the caves of Mendip, is represented by a jaw from the Cave-earth. It may be recognised by its uniting a size which nearly approaches that of *A. amphibius* to the dentition of *A. subterraneus*.

Castor fiber.—We have met with five specimens of the Beaver from the Cave-earth.

Phocæna communis.—A solitary scapula of this cetacean has been furnished by the Black Mould.

In this list we have merely noticed the species that have passed through our hands, without reference to the previously published list of animals from the Cave.

SIXTH REPORT. Read at Liverpool, September, 1870. (See *Rep. Brit. Assoc.* 1870, pp. 16-29.)

The Committee have again the pleasure of reporting that they have been enabled to render assistance to those engaged in similar researches elsewhere. Sir J. K. Shuttleworth, Chairman of the Committee who have recently undertaken to explore caves in the Mountain Limestone near Settle, in Yorkshire, opened a correspondence with the Secretary of the work in Kent's Cavern, which eventuated in an arrangement that Mr. Jackson, Superintendent of the Settle investigations, should visit Torquay for the purpose of making himself fully acquainted with the mode of operation carried out there. Accordingly, on March 1, 1870, he reached the Cavern, where every facility was given him by the Superintendents and the workmen for familiarizing himself with the work in all its details.

The South Sally-port, continued.—The Entrance of the South Sally-Port, in the eastern wall of the Lecture Hall, is about 10 feet wide, 80 feet west and 52 feet south of the Arched or Southern Entrance of the Cavern. Its direction is, on the whole, towards the south-east; and with its ramifications it occupies a space of about 80 feet from east to west, and 40 feet from north to south. Its width varies from 21 to 2 feet, and averages about 10 feet. There is not the least indication that it leads to an external opening, or that any animals ever found or formed a passage into it from the

exterior. Indeed, its direction is not such as to take it to the hill-side.

Before the Committee commenced their operations in it, the height of its roof above the surface of the deposit at its Entrance was about 4 feet. At 45 feet in the interior this had so diminished as to render it necessary to excavate to the depth of 5 feet, instead of the customary 4, to secure sufficient height for the workmen; and through nearly 30 feet before reaching the inner end the deposit and roof were in contact.

At the Entrance, and for some distance within it, the roof and walls bore no indications of either the corrosive or erosive action of water, the edges of the beds of Limestone being everywhere angular and sharp. Farther in they assumed a corroded or fretted aspect; and still farther, the roof had the appearance of a fissure, in which the walls gradually approached at higher and higher levels, and a large mass of Limestone threatens to fall at no very distant future; indeed, a block of great size, which must have fallen at the Entrance in what may be called comparatively very recent times, gave the workmen a great amount of labour in blasting and removing it. It is probable that the angular sharp character of the roof and walls at this part, already mentioned, is due to the recent severance of this mass. It may be doubted whether the fissure-like character of the roof just spoken of is anything more than one of the "joints" so common in all the palæozoic rocks of Devonshire and Cornwall, slowly widened by the action of acidulated water. At and near this part the walls are much corroded, and not unfrequently fretted into holes rudely resembling the so-called *lithodromous perforations* met with in Limestone rocks in various localities. Beyond the "Fissure" there are several conical holes in the roof, which, as they ascend, rapidly diminish in size. Most of them are more or less tortuous, thereby rendering it impossible to say whether they pass upwards to the surface of the hill in the form of Swallow-holes. Some of them are lined with stalagmitic matter, while others, showing the naked Limestone, have a very decided water-worn aspect. A few of both kinds have faint traces of reddish soil, while others are perfectly clean. Near the inner end of this branch of the Cavern the walls in several places indicate the long-continued erosive action of water.

A Floor of Granular Stalagmite, varying from 21 inches to 1 inch in thickness, extended from the Entrance to about 15 feet within it. Beyond this there was no trace of any-

thing of the kind, until reaching 27 feet, where small patches presented themselves at considerable intervals. At length they became more numerous and decided; and at 50 feet there was a continuous Floor from wall to wall, varying from 1 inch to upwards of 2 feet in thickness, and extending, without interruption, to the end. It is perhaps worthy of remark that, from its Entrance to upwards of 40 feet within it, the South Sally-Port is remarkably dry at all seasons, but that beyond this area it is greatly exposed to drip. There is no doubt that the Granular Stalagmitic Floor at its Entrance was formed of calcareous matter which had not been furnished by or through the surrounding roof or walls of the Sally-Port, but had flowed in from the adjacent Lecture Hall.

On the Granular Stalagmite at the Entrance there was a layer of Black Mould, differing from that found in the same position in other branches of the Cavern in containing an admixture of the typical Cave-earth, which became more and more abundant farther and farther in, until, at about 30 feet from the Entrance, the deposit was exclusively Cave-earth from top to bottom of each section. At 50 feet from the Entrance, where the inner Stalagmitic Floor began, the following was the succession of deposits in descending order:—

First. Cave-earth, from 12 to 21 inches thick. [Not improbably a portion of the Cave-earth excavated in the adjacent Lecture Hall, and lodged here by the earlier explorers.]

Second. Granular Stalagmitic Floor, from 1 to 24 inches.

Third, or lowest known. Cave-earth of unknown depth, but exceeding 5 feet.

The Cave-earth was commonly of the ordinary character—a mixture of red loam and angular pieces of Limestone in about equal quantities. Occasionally subangular and well-rounded pieces of red Grit were found in it; and it everywhere contained blocks of Stalagmite, sometimes of considerable size. From the Entrance to 45 feet within it, there were also in the Cave-earth numerous large masses of Limestone, several of which required to be blasted in order to their removal. In some instances they projected upwards through the deposit and the overlying Stalagmite; and in one case a block so interrupted the continuity of the latter as to leave a passage, under the block itself, into the deposit beneath, of which it was obvious that some burrowing animal had availed itself. No such masses were found beyond the 45 feet just mentioned.

From the Entrance to 60 feet within it, the Cave-earth was

traversed by tunnels, running, on the whole, longitudinally and horizontally, with an occasional bifurcation. In most cases they were adjacent to one of the walls of the Cavern or to one of the large fallen masses of Limestone just mentioned; but occasionally they passed entirely through the Cave-earth, when their vertical transverse sections were either circular or elliptical, and varied from 6 inches to 2 feet in diameter. Their sides and roof were tolerably smooth, but less so than their floors, which were firmly compacted and somewhat blackened, as if by frequent passing. Careful attention was given to them, but very few objects were found, the most important, besides those mentioned in the Fifth Report, being a canine tooth of *Felis spelæa*, and an accumulation of dry moss, probably the nest of some animal. There were no tunnels in the innermost 20 feet of this Sally-Port.

At 34 feet from the Entrance, and for some distance beyond, the deposit, below the third Foot-level, adjacent to the south wall of the Sally-Port, consisted of materials closely resembling those which composed the Breccia below the Crystalline Stalagmitic Floor in the South-west Chamber and the Water Gallery, described in the Fourth and Fifth Reports, but quite incoherent and destitute of fossils; while the typical Cave-earth, at the same level and adjacent to the opposite wall (a distance of a very few feet at most), yielded the usual complement and variety of specimens.

From 57 to 60 feet from the Entrance, the deposit below the second Foot-level contained no stones of any kind, and consisted of very fine firmly compacted earth having very few fossils.

At 38 feet from the Entrance, where there was no Stalagmitic Floor, there was a thin band of charcoal about 3 feet long and 2 feet broad, 10 inches below the surface, and midway in the section, with interspaces of upwards of 3 feet between its ends and the walls of the Cavern.

The upper surface of the deposit was an inclined plane dipping towards the inner end, where it was 10·5 feet lower than at the Entrance, while the latter was 13 feet lower than the surface of the Cave-earth at the Arched, or Southern, Entrance of the Cavern. Indeed, the extremity of the South Sally-Port is the lowest point of the Cavern which has at present been reached, and is 23·5 feet below the surface of the Cave-earth at the Southern Entrance.

Besides a large number of bones (including several of birds and a few of fish) and portions of antlers, the South

Sally-Port yielded about 1400 teeth and identifiable fragments of teeth, some of which were in jaws or portions of jaws. The entire series may be distributed as in the following Table:—

TABLE I.—Showing how many per cent. of the Teeth found in the Cave-earth in the South Sally-Port belonged to the different kinds of Mammals.

	per cent.		per cent.
Horse	29	Deer, including Reindeer	
Hyæna	27	and "Irish Elk"	2
Rhinoceros	11	Lion	2
Bear	8	Ox	1
Sheep	7	Wolf (?)	} each less than 1
Badger	3	Hare	
Fox	3	Dog (?)	
Rabbit	3	Pig	
Elephant	2		

In the Table the arrangement is throughout that of descending order. Thus the teeth of Badger, Fox, and Rabbit formed, each about 3 per cent. of the entire series; but the first were rather more, and the third rather less, abundant than the second; and so on in other cases.

From the disturbed state of the deposits in this branch of the Cavern, the Committee were prepared for the commingling of bones and teeth having a modern aspect with those bearing all the indications of antiquity. Accordingly some remains of the principal extinct Cave-mammals were found in the deposit above the Stalagmitic Floor where this existed, and on the surface of the Cave-earth where it did not; and, in like manner, though very few remains were found in the tunnels, skulls, jaws, and teeth of Sheep were met with somewhat frequently at all depths. As has been already stated, the tunnels ceased at about 60 feet from the Entrance of the Sally-Port; and there also ceased the inosculation of ancient and modern relics; the latest recorded case of Sheep below the Granular Stalagmite was one tooth, in the first Foot-level, at 62 feet from the Entrance of the Sally-Port; and beyond this point there was no instance of any part of an extinct Mammal above the Floor. Agglutinated lumps of Beetles' wings and wing-cases were met with at all levels within the disturbed area.

The specimens found in the Granular Stalagmitic Floor, though but few, were of considerable interest. Amongst them were teeth of Bear, Elephant, Hyæna, and Rhinoceros,

thus confirming the statements made by the Committee in previous Reports, that at least some of the extinct Cave-mammals outlived the period represented by the Cave-earth. (See pp. 200, 208, 232, 238, 267 above.)

As elsewhere in the Cavern, some of the bones of the extinct mammals were gnawed, some greatly discoloured, and some, irrespective of the Level they occupied, invested with films of Stalagmite.

Some localities were rich, while others were poor in specimens. Occasionally they were found almost exclusively against one wall of the Cavern, while in other instances their distribution was tolerably uniform. They continued to present themselves in the higher Levels after they had ceased to do so in the lower ones; thus in the fifth or lowest Foot-level there were none beyond 51 feet from the Entrance; in the fourth they continued up to 59 feet, and a solitary Hyæna's tooth was found 17 feet beyond this; in the third Level they were met with in tolerable abundance as far as 60 feet, and a tooth of Rhinoceros with a fragment of bone appeared at 65 feet; the last specimen in the second Level occurred at 73 feet, and in the first at 76 feet. Nothing was found in the innermost 4 feet.

In the South Sally-Port twenty-one Flint implements and flakes were found, of which ten were mentioned and four briefly described in the Fifth Report. Of those which have since been discovered, two only require special notice.

No. 4521, found 6th September, 1869, at 53 feet from the Entrance of the Sally-Port, made of white Flint, lanceolate, 3·1 inches long, 1·1 inch broad, ¼ inch thick at the but-end, in the third Foot-level of undisturbed Cave-earth, over which the Granular Stalagmite was 2 feet thick. A tooth of Horse, a tooth of Rhinoceros, and a jaw of Rabbit were found with it.

No. 4561, found 11th September, 1869, at 55 feet from the Entrance of the Sally-Port, with a tooth of Horse, a tooth of Rhinoceros, and a coprolite, in the fourth Foot-level of Cave-earth, over which the Granular Stalagmite was 14 inches thick. It was made of white Flint, lanceolate, strongly carinated on one face, slightly concave longitudinally on the other, where a crowd of facets indicated the dislodgment of numerous small chips. It was 4·4 inches long, 1·1 inch broad, and ⅓ inch thick at one end, whence it tapered gradually, but it had lost its point. It was the best tool of its type hitherto found in the Cavern.

Amongst the remains of animals there was part of an

antler, No. 1884, which had been gnawed. One of the grooves or scores on it, however, was unusually deep and extended almost completely round it, being interrupted at two opposite points only. It was so utterly without a parallel amongst the multitude of gnawed bones found in the Cavern, that it seemed less unreasonable to ascribe it to human agency than to the teeth of any animal. It was found, with a tooth of Horse, bones, bone-fragments, and a coprolite, on September 23rd, 1869, at 59 feet from the Entrance, in the third Foot-level of Cave-earth, beneath the Floor of Granular Stalagmite 16 inches thick.

The exploration of the South Sally-Port absorbed nearly six months, and was completed on November 12th, 1869.

The North Sally-Port.—The Entrance of the North Sally-Port is in the east wall of the Great Chamber, 28 feet south and 42 feet west of the Arched Entrance of the Cavern. All that was known about it when the Committee commenced its exploration was, that it was a rude tunnel about 27 feet long, 8 feet high and 6 feet wide at its Entrance, having a rugged Floor of Granular Stalagmite more or less interrupted by large and small masses of Limestone, and rapidly descending from the mouth to the inner end, where the tunnel was about 3 feet wide, with the Floor and roof in contact, except a small aperture on the right, and a slightly larger one on the left. That on the left is now known to be a low labyrinthine passage, varying from 1·5 to 9 feet in breadth, but rarely exceeding 3 or, at most, 4 feet, ramifying very tortuously, and with sundry bifurcations and transverse passages, through an area measuring about 86 feet from north to south, 84 feet from east to west, and terminating in at least one external opening in the eastern slope of the hill, in the same vertical plane as the well-known Arched or Southern Entrance of the Cavern, but about 18 feet below it, and 10 feet further eastward. [Two other external openings or Entrances, in connection with this Sally-Port, were subsequently discovered. See Seventh Report, below.]

The North Sally Port, then, has an *external* as well as an *internal* Entrance. The former, that just discovered, is nearly due east from the latter, and by the least circuitous route is upwards of 140 feet from it. Excursions, however, may be made in various other directions; and, indeed, one or two of what are supposed to be minor branches remain to be excavated. In one part, nearer to its internal than to its external Entrance, the labyrinthine passages have cut the

Limestone rock into three insular masses, known as the "Islands."

Up to 20 feet from the internal Entrance the excavation was limited to the usual depth of 4 feet below the base of the Granular Stalagmitic Floor; but beyond this point it was found necessary to sink to 5, and in some places 6 feet, on account of the lowness of the roof; and even now those who traverse the various passages have to be careful in their movements, so as to avoid collision with the various projections and pendants.

In what may be termed the first "Reach" of the North Sally-Port—that which has always been accessible—the roof and walls are much fretted, except certain portions of the southern side, which are clothed with heavy masses of stalagmitic matter. The passage on the north-west of the "Islands" has the aspect of a water-course whose roof and walls have subsequently been much fretted, and in some places corroded into holes, perhaps somewhat more closely resembling "lithodomous perforations" than those in the South Sally-Port, already mentioned. (See p. 275 above.) Between the "Islands" and the external Entrance, indications that the passages are deserted watercourses frequently present themselves, and holes occur in the roof at various places—some lined with stalagmite, some naked, some slightly stained with soil, and some perfectly clean.

A Floor of Granular Stalagmite, in many cases so charged with fragments of Limestone as to be a concrete extremely difficult to break up, extended continuously from the Internal Entrance of the Sally-Port to 14 feet within it, and in some instances attained the thickness of 33 inches. Thence to 16 feet it thinned out before quite reaching the north-eastern or left wall, after which it was again continuous to the end of the first Reach, where it was in contact with the roof, and 12 inches thick. Beyond this the Stalagmite was very partial, rarely extended quite across the passages, and more frequently than otherwise there was no trace of it. In the passage on the south-western side of the two principal Islands, as well as in the narrow Strait dividing them, there were two more or less contiguous Stalagmitic Floors one over the other, with an interspace of from 5 to 20 inches. In various places there were, adhering sometimes to one wall only and sometimes to both, rude moulding-like remnants of a Floor which had been destroyed.

From the Internal Entrance, through the entire length of the first Reach and 8 feet inwards in the second, but in no

instance beyond, the Black Mould, varying from 10 to 20 inches in depth, lay everywhere on the Granular Stalagmitic Floor, where the latter existed, and on the Cave-earth where it did not, the junction being sharply defined. Beyond the end of the first Reach the upper surface of the Black Mould approached the roof to within, at most, 10 or 14 inches.

The deposit next below the Granular Stalagmitic Floor was the Cave-earth, being of the typical character to the depth of at least 2 feet, below which it frequently consisted of loam of darker red and subangular pieces of Grit of the same colour—the materials of the Breccia rather than of the Cave-earth. In every passage and at all Levels there were incorporated in the Cave-earth fragments of Stalagmite, varying in volume from a cubic inch to 10 cubic feet. There were also, but in less abundance, well-rolled fragments of rock not derivable from the Cavern-hill. Amongst the latter was a portion of a yellowish drab pebble of fine-grained Grit or Quartzite, which had obviously been broken and subsequently rolled. This specimen was met with about 5 feet within the new or External Entrance of the Sally-Port.

At 19 feet from the Internal Entrance, a tunnel was found in the fourth Foot-level of the Cave-earth, adjacent to the north-east wall; and at 22 feet another was broken into on the opposite side. A transverse vertical section of the latter was a semi-ellipse, measuring 18 inches in breadth at the bottom, and the same in height, while another section of it, a few feet farther in, measured 33 and 24 inches respectively. That on the opposite side was not quite so large. They were both continued through the remainder of the first Reach and to about 6 feet in the second, where they ended. Their depth below the surface was tolerably uniform throughout; but they were not always adjacent to the walls of the Cavern. Nothing of the kind was found again, except at about 30 feet beyond the point just specified, where a small tunnel, about 2 feet long, was laid open. In this branch of the Cavern the tunnels had the aspect of water-courses rather than of burrows. Occasionally bones and pieces of Limestone projected from their sides; and it was observed that the exposed portions of the latter had always the blanched appearance of such stones when found in shallow soil on Limestone and beneath a thin covering of turf, while their remaining portions were of the same colour as the deposit in which they were lodged. No modern bones or other objects were found in the tunnels.

The upper surface of the Cave-earth at the Internal Entrance of the North Sally-Port was 5·5 feet below that at the Arched Entrance of the Cavern; thence to the External Entrance, by the most direct route, it formed three inclined planes—of which the first fell 16 feet, towards the exterior of the hill (i.e. eastward), in a length of 67 feet—the fall, however, being by no means uniform in amount. In the second plane the dip was reversed, and the workmen in their excavations ascended 8·5 feet in a length of about 45 feet, after which the dip towards the exterior was resumed, and continued to the External Entrance, giving a fall of five feet on reaching it. Hence the surface of the deposit at the External Entrance was 12·5 feet lower than at the Internal, and 18 feet lower than at the Arched Entrance of the Cavern.

The North Sally-Port contained very large quantities of bones and other remains of Mammals.

So long as it presented itself, the overlying Black Mould yielded potsherds, marine shells (including *Cardium*, *Pecten*, and the internal shell of Cuttle-fish), and bones (chiefly modern, but a few of extinct animals—the astragalus of Rhinoceros being the most important of the latter).

In one instance only, about 26 feet before reaching the External Entrance, did bones occur in the Granular Stalagmitic Floor; and these were few and, in themselves, unimportant.

The distribution of the fossils in the Cave-earth was very irregular. The first four Foot-parallels contained no specimens of any kind. Nothing was found in the second Foot-level until reaching 7 feet from the Internal Entrance, and nothing in the first until the excavation had reached 11 feet; after which fossils were met with in tolerable abundance in every Parallel, and almost in every Level, as far as 33 feet, even where local peculiarities made it necessary to excavate to the depth of 6 feet.

Perhaps their irregular distribution was nowhere more strongly marked than in the various passages connected with the Islands, commencing at the point just specified—33 feet from the Internal Entrance. Along the entire North-Western passage fossils were very abundant, culminating probably on January 19th, 1870, when two Yards of Cave-earth lying one on another (in other words, a parallelopiped of the deposit measuring 3 feet long, 2 feet deep, and 1 broad, and therefore containing 6 cubic feet of matter) yielded 51 teeth of *Hyæna*, 45 of Horse, 27 of Rhinoceros, 8 of Deer, 3 of Elephant, and 1 of Wolf (?) or Dog (?), 4 astragali of Rhinoceros, 3 portions of antlers, and a huge assemblage of bones and fragments of

bones. Along the northern and north-eastern sides of the Islands they became less numerous, especially in the third Foot-level. On the east there were none in the lowest two Foot-levels. On the south 320 cubic feet of deposit was found to contain no more than four specimens. The low passage terminating at the south-west angle of the Islands, and in which the deposits very nearly reached the roof, opened into one of much greater height, in which the Cave-earth was covered with a Granular Stalagmitic Floor 4 inches thick. In this Floor, almost at the commencement of the passage, there was a rudely circular hole, about 18 inches in diameter. The Secretary, who was present when this was disclosed, drew himself up through the opening so far as to command a view of the space above, when he found, mixed with a small amount of Cave-earth, a vast accumulation of bones and teeth, some of which were partially imbedded in the Stalagmite. Above this mass of remains was, as has been already stated, another Floor of Stalagmite, the space between the two being at that point about 20 inches in height. The workmen proceeded to break up both Floors; and the labour was rewarded by the immediate exhumation of 29 teeth of Hyæna, 21 of Elephant, 21 of Horse, 18 of Rhinoceros, 7 of Deer, including the "Irish Elk," 2 of Wolf (?) or Dog (?), 1 of Bear, and such a heap of bones and bone-fragments as to render it necessary to send for a cart for the removal of the "find." The upper Floor was about six inches thick, and had a considerable space above it, in which there were neither deposit nor fossils. The two Floors (the upper one being partially destroyed), with their rich intermediate layer of bones and Cave-earth, extended along the entire passage on the south-western side of the Islands, and through the Strait separating the two largest of them. In short, the fossil treasures there were a continuation of those which had previously been met with on the north-west. Nothing was found in the deposit beneath the lower Floor.

In a considerable recess on the south-east of the Islands, out of which not less than 280 cubic feet of matter was dug, the only things found were a very few bones of Birds. In the passages leading from the north-eastern angle of the Islands, fossils were, with a few exceptions, tolerably abundant, but were most prevalent in the upper Levels.

Of teeth alone, the North Sally-Port yielded at least 2600, belonging to the animals, and in the proportions, shown in the following Table:—

TABLE II.—Showing how many per cent. of the Teeth

found in the Cave-earth in the North Sally-Port belonged to the different kinds of Mammals.

	per cent.		per cent.
Hyæna	31	Lion	2
Horse	31	Bear	1
Rhinoceros	16	Fox	} each less than 1
Deer, including "Irish Elk" and Reindeer	6	Beaver	
Badger	4	Wolf (?)	
Rabbit	2	Dog (?)	
Elephant	2	Cat	}
Ox	2	Sheep	

Among the peculiarities of this branch of the Cavern were the comparatively large numbers of remains of Badger, Elephant, and Beaver; and, when compared with those in the other Sally-Port, the small number of relics of Sheep, of which the only remnant was one tooth.

The teeth of Elephant were not only relatively more numerous, but some of them exceeded in size any that had been found elsewhere in the Cavern; and the plates of a few of them were remarkably thick.

The number of Beavers' teeth was eight:—three molars in part of a jaw (No. 4789), found December 20th, 1869, with two teeth of Horse, in the first Foot-level of Cave-earth; a loose molar (No. 4801), found the next day, in the same Level and the adjoining Foot-parallel; and an almost perfect left lower jaw (No. 4800), with three molars and the fang of the incisor *in situ*, found on May, 3rd, 1870, in the fourth Foot-level, upwards of 50 feet from the former specimens.

Many of the bones were gnawed, some more or less covered with films of stalagmite, some greatly discoloured, and a few had the aspect of the remains found in the Breccia beneath the Crystalline Floor of Stalagmite described in previous Reports.

Taken as a whole, the osseous remains found since the Fifth Report was presented were probably superior to those found in any previous year.

Instances of the commingling of ancient and recent remains occurred in the North as well as in the South Sally-Port, but they were by no means so abundant. [They no doubt admit of the same explanation. See p. 278, above.]

In the branch of the Cavern now under notice there were found seven Flint implements and flakes, of which one was in the Black Mould overlying the Granular Stalagmite, one in

the first Foot-level of Cave-earth, two in the second, two in the third, and one in the fourth Foot-level. Three appeared to have been struck from common Flint nodules, and are comparatively unimportant.

The remaining four are good specimens, but only one of them (No. 5124) needs description. It was ovoid, worked to an edge all round its perimeter, 2·7 inches long, 1·6 inch in greatest breadth, and ·3 inch in greatest thickness. The bulb of percussion was well displayed on the inner surface, which was concave in every direction, but especially in that of its greatest axis. The outer surface was convex, or, rather, was formed of a series of distinct approximately plane surfaces, which concurred to give it a considerable convexity. There were indications of a great amount of work along the entire margin on its outer face. Its colour was a very light grey inclining to white, but with indications of a dark interior. It was found with a tooth of *Hyæna*, a tooth of *Rhinoceros*, bones, and coprolites, May 24th, 1870, in the first Foot-level of Cave-earth, about 40 feet from the external Entrance.

Of the seven specimens, five were found nearer to the external than to the Internal Entrance, and one (No. 5165), a small but good specimen, was no more than 15 feet from it.

Two of the bones found in this Sally-Port appeared to have been cut artificially. The first (No. 4881) was found December 22nd, 1869, with remains of Badger, Fox, Horse, *Hyæna*, Ox, and *Rhinoceros*, 24 feet from the Internal Entrance, in the fourth Foot-level of Cave-earth, over which was a continuous Floor of Granular Stalagmite, 12 inches thick.

The second (No. 4833) was found about 47 feet from the same Entrance, on January 24th, 1870, with remains of Elephant, Horse, *Hyæna*, and *Rhinoceros*, in the second Foot-level of Cave-earth, over which there was no Stalagmite.

One of the fish-bones (No. 5036) appears to have been pointed and used as a Pin or Awl. It was met with on April 21st, 1870, rather nearer to the Internal than the External Entrance, in the second Foot-level of Cave-earth, which was not covered with Stalagmite.

The exploration of the North Sally-Port was begun on November 12th, 1869; and in something more than eight months the workmen had dug their way through it. The new Entrance was reached on July 19th, 1870. There are, however, one or two of its ramifications not yet excavated, having been passed intentionally in the progress of the work. How far they extend is at present unknown.

The External Entrance of the North Sally-Port.—Though the Superintendents have no doubt of the existence of the External Entrance of the North Sally-Port, the workmen have not dug their way through it to the day. The following is the evidence on the question:—During eight months the direction of excavation had on the whole been outwards; *i.e.* towards the hill-side, which, from the ground-plan of the work and the contour of the hill itself, was obviously nearly reached. This was confirmed by the appearance of very fine rootlets, not through the roof, but horizontally in the deposit, becoming larger and larger as the work advanced, until they became roots two inches in diameter. The deposit had always been bounded by Limestone walls on each side, and by a roof of the same material, between which and the Cave-earth the interspace, where any existed, never exceeded a few inches in height. On July 19th, 1870, the workmen suddenly ceased to be able to find a wall on the right or outside, or a Limestone roof above them; and at the same time, and as suddenly, they were unable to reach the upper surface of the deposit, which had also undergone a change of characters. The materials through which they had now to drive were, first, or lowest, the Cave-earth, with remains of the ordinary Cave-mammals, above which was an accumulation of small angular pieces of Limestone, with but little earth and no fossils, and more or less cemented into a very loose concrete with stalagmitic matter; and the roof, or that which supplied its place, was of the same character—materials, in short, found everywhere in the upper portions of the numerous Limestone fissures of the district. At that moment they were, according to the measurements, in the same vertical plane as the Arched Entrance of the Cavern, at a level of about 18 feet below it, and upwards of 10 feet outside or east of it. In other words, they had dug their way through the Cavern into a talus of earth and stones lining the hill-side, and which, from its upper surface to that on which they stood, was 18 feet deep.

Two reasons prevented their attempting to break through this mass to the open day:—first, it would destroy the only road to the Cavern; and second, the attempt seemed somewhat hazardous, as the material showed a great tendency to “cave in.” It being necessary, however, to confirm or disprove the conclusion that they had found a new Entrance, a tunnel was dug through the talus 12 feet long, varying from 4 to 8 feet wide, and having the Limestone rock for its inner or left boundary. The result was the same throughout: the

floor and lower portion of the right or outer wall was the Cave-earth with the characteristic specimens; and the upper portions of this wall, as well as the ceiling, consisted of the loose concrete already described, and containing no fossils.

As there was nothing further to be gained and the work seemed unsafe, the tunnel was discontinued. No doubt remained that the workmen had emerged from the Cavern, and, in cutting the tunnel, had been laying bare a portion of the Limestone hill on the left. It may be of interest to remark that this Limestone overhung about 2 feet, so as to afford a "Shelter" to that extent.

The lower portion of the external talus, spoken of above as *Cave-earth*, was in fact a fine silt with scarcely a trace of the common red colour, and closely resembled material which, from time to time, had been found within the Cavern. Among the remains found in it were 11 teeth of Bear, 7 of Horse, 5 of Hyæna, and 4 of Rhinoceros. The bones, of which there was a considerable number, were frequently broken, decayed, and discoloured.

With the animal remains, two Flint implements (Nos. 5222 and 5236) and a flake (No. 5226) were met with.

No. 5222, which alone need be described, was a good lanceolate Tool, 2·5 inches long, 1 inch broad at the but-end, and ½ inch in greatest thickness, strongly carinated on one face where it has three longitudinal facets. It was of white Flint, and found on 26th July, 1870.

Smerdon's Passage:—The New External Entrance opens, not only into the North Sally-Port, but also into an unsuspected passage or undervaulting, which, so far as is at present known, varies from 4 to 10 feet wide, and extends in a north-westerly direction. It has received the name of Smerdon's Passage, after the foreman of the excavators. On abandoning the tunnel just mentioned the workmen began the exploration of this Passage, and at the end of August 1870 they had advanced about 20 feet into it. The deposit, typical Cave-earth, had a few thin patches of Stalagmite but nothing like a continuous Floor, and everywhere reached the roof, or within a few inches of it. It contained a considerable number of pieces of Limestone, from 10lbs. in weight and downwards; a few subangular and rounded pieces of red Grit; and numerous blocks of Crystalline Stalagmite, some of them measuring 5 or 6 cubic feet.

A large number of bones and upwards of 700 teeth were found in the Cave-earth.

The teeth may be apportioned as in the following Table:—

TABLE III.—Showing how many per cent. of the Teeth found in the Cave-earth in Smerdon's Passage, so far as it had been explored on 31st August, 1870, belonged to the different kinds of Mammals.

	per cent.		per cent.
Hyæna	57	Deer, including "Irish	} 2
Horse	19	Elk" and Reindeer .	
Rhinoceros . . .	12	Elephant	1
Badger	3	Lion	} each less 1
Bear	2	Wolf or Dog }	
Fox	2		than

Some of the bones were gnawed, some discoloured, and some more or less covered with films of Stalagmite. Several agglutinated lumps of bones of very small animals were also met with—one of them containing upwards of 1200 bones—coprolites; three Limpet Shells; a bit of charcoal; and four good Flint flakes.

It is difficult to refrain from speculating on some of the facts stated above.

Mr. Mac Enery, as already stated (see pp. 216, 267 above) named the Sally-Ports from a conviction that they led to External Entrances in the hill-side, relying, first, on their direction; secondly and chiefly, on the tunnels, which he ascribed to burrowing animals. The first was obviously not very conclusive, for he could not but be aware that unless the so-called Sally-Ports extended considerably beyond the point to which he could penetrate, and without much tortuosity—about which no opinion could be formed—they must fall far short of the exterior.

With regard to the tunnels, even if in all cases ascribable to burrowing animals, it by no means followed that they were begun at, or connected with, the exterior of the Cavern, for as there were well-known spots in each of the Sally-Ports having no Stalagmitic Floor, there was no difficulty in supposing animals to have begun their burrows in these unprotected localities, to have sunk at first more or less vertically in the deposit, and at a suitable depth to have proceeded horizontally. Mention was made in the Fifth Report (see p. 268 above) of vertical openings of such a character; and that this must have been the mode of operation is now rendered still more probable by the fact that no tunnels occurred at or near the hill-side ends of the Sally-Ports.

As has been stated in previous Reports, the Committee had long been familiar with the presence of blocks of Stalagmite in the Cave-earth, and had inferred from them that an ancient Stalagmitic Floor of the Cavern had been broken up by natural agency before, as well as during the introduction of the Cave-earth and the formation of the Granular Stalagmite. There seems no difficulty in conceiving of a machinery by which such a Floor might have been destroyed in the comparatively large and lofty Chambers. For example, it was known that the deposit the Crystalline Stalagmite had covered and on which it had been formed, had been, in certain parts of the Cavern, partially dislodged, or had subsided, so as to leave the Floor unsupported; it was also known that blocks of Limestone, some of them scores of tons in weight, had from time to time fallen from the roof; and it was not difficult to see that such blocks would break into fragments any such unsupported Floor on which they might fall.

This, however, fails utterly to account for the destruction of a Floor in a narrow low passage, such as the North Sally-Port. That a Floor of Stalagmite had been destroyed there admits of no question, since, as has been already stated, remnants of it still adhere to the walls, to say nothing of its abundant fragments in the Cave-earth below. That it was not destroyed by the fall of blocks of Limestone is obvious from the facts that its remnants attached to the walls show that it was almost in contact with the roof as it now exists, and that the roof itself presents no indications that such masses have been detached from it. [The following is offered as a hypothetical solution of the problem:—Let it be supposed that the interspace beneath the unbroken Floor, caused by the dislodgment or subsidence of the Breccia, was a water-course, at least in times of flood, and that occasionally the vent or outlet became choked, it is not difficult to see that a sudden and great rush of water, seeking escape through such a channel, would blow up the comparatively thin sheet of Stalagmite forming the roof of the interspace. Such a catastrophe is by no means a very rare event even in sewers believed to be well constructed. (See *Trans. Devon. Assoc.* viii. 175-6.)]

Many of the Potsherds found in the Black Mould in the North Sally-Port were considerably beyond the point where Man could have actually placed or lost them, though not perhaps beyond a point where he could have thrown them,

supposing him to have had a motive for doing so. It seems not improbable, however, that being, as they were, on a highly inclined plane of very contracted width, their presence in the spots they occupied was due to a participation in a slow and gradual movement of the Black Mould downwards and inwards, in consequence of the frequent passage of small recent animals.

There is greater difficulty in accounting for the occurrence of keen-edged Flint Implements and flakes in the Cave-earth at and near the External Entrance of the North Sally Port. There is every reason to believe that the Cave-earth found in the successive chambers at the highest level of the Cavern was introduced through the long known North and South, or Triangular and Arched, Entrances; whence it seems to follow inevitably that at that time the bottom of the Valley bounding the Cavern hill was but little below these Entrances, and therefore nearly 20 feet above the level of the Entrance just discovered. That the Implements were of human origin there cannot be a doubt; but it cannot be supposed that Man placed them where they were found under the conditions just stated, for the bottom of the Valley being then far above the newly-found low-level Entrance, the passages into which it immediately opens must have been inaccessible and not available for human resort. On the other hand, the hypothesis that the Flints were washed there from the high-level Chambers appears to be entirely negatived by the fact, that though lodged in a deposit largely charged with stones, they were entirely unrolled and retained their keen edges. It may be added that very few, if any, of the bones found with them showed any marks of abrasion; that the Implements were more numerous at and near the External Entrance than elsewhere in the Sally Port, and that no such phenomenon presented itself near the end of the South Sally-Port, which has no External Entrance.

May not the following be the solution of the problem? The Implements and remains of Mammals found at the new Entrance and in the parts of the Cavern connected with it were deposited after it had been laid bare through the gradual deepening of the valley, and are chronologically separated from those in the high-level Chambers by an amount of time sufficient to deepen the valley to the extent of 20 feet, but not sufficient to make any change in the fauna of the district, or in the character of the Implements which its Human dwellers employed.

SEVENTH REPORT. Read at Edinburgh, August, 1871. (See *Rep. Brit. Assoc.*, 1871, pp. 1-14.)

Smerdon's Passage, continued.—The Committee stated in their Sixth Report, that, in excavating the "North Sally-Port," they had been led to a third External Entrance to the Cavern, in the same Limestone cliff as the two Entrances known from time immemorial, but at a considerably lower level, where it was completely buried in a great talus of *débris*. After adding that it had not been thought necessary, or desirable, or even safe to dig through the talus to the open day, they stated the facts which left no doubt of their having penetrated to the outside of the Cavern. (See p. 287 above.) During the winter of 1870-71, the question of the existence of this third Entrance was put beyond all doubt; for, after a considerable rainfall, that portion of the talus which the workmen had undermined fell in, and thereby laid open the Entrance. The cavity was at once filled up, in order to prevent anyone from intruding into the Cavern.

It was also stated in the Sixth Report that the new or low-level opening was the External Entrance not only of the North Sally-Port, but of another and unsuspected branch of the Cavern, to which had been given the name of "Smerdon's Passage," the exploration of which had been begun.

This Passage was found to consist of two Reaches, the first, or outermost, being about 25 feet long, from 3 to 10 feet wide, and having a northerly direction. Near its southern end there were in the roof a few circular holes from 6 to 12 inches in diameter, apparently the mouths of tortuous shafts extending for some distance into, or perhaps through, the Limestone rock. The roof itself and the adjacent portions of the wall bore traces of the long-continued *erosive* action of running water, but below the uppermost 12 or 18 inches the walls had many angular sharp inequalities. Farther in, the roof had an irregular fretted aspect, apparently the result of the *corrosive* action of acidulated water, while the walls retained the angular appearance just mentioned.

The Second Reach ran nearly east and west, was about 32 feet long, somewhat wider than the first, and its roof was several feet higher. At its eastern end the roof and walls were much fretted; farther in, there were holes in the roof similar to those just mentioned, with the exception of being larger. Some of them contained a small quantity of soil, resembling Cave-earth, and firmly cemented to the wall; while adjacent to others there was a considerable amount of stalactitic matter. Still farther in, the roof, which had the

aspect of a watercourse, was covered with a thin veneer of white stalactite; and near the inner end there was a considerable hole in the roof containing a large accumulation of the same material.

At the western, or inner, end of this second Reach, the Limestone roof gave place to one consisting of angular pieces of Limestone cemented with carbonate of lime into a very firm concrete. In removing this, the workman thrust his iron bar up through it, and found he had thereby opened a passage into the eastern end of that part of the Cavern known as the Sloping Chamber, the concrete Floor of which was at the same time the roof of the Passage.

At the eastern end of the Second Reach there was found another external Low-level Entrance, about 20 feet north of that previously mentioned, and having no marks of the action of water.

Narrow ramifications extended through the Limestone rock from both Reaches of Smerdon's Passage, westward from the first, and southwards from the second, and intersected one another; their roofs were also perforated with holes, and exhibited traces of the action of running water.

Throughout both Reaches there were in certain places strips of Granular Stalagmitic Floor extending continuously across from wall to wall, and varying from a quarter of an inch to 6 inches in thickness; the most important being about 8 feet long. Elsewhere the Cave-earth was either completely bare, or had on it here and there what may be called conical scales of Stalagmite, from 3 to 12 inches in diameter at the base, and from 1 to 4 inches in thickness at the centre. From them, and generally near the middle, there rose not unfrequently one or more rudely cylindrical masses of the same material, sometimes 9 inches high, 6 inches in circumference, and locally known as "Paps," or "Cow's Paps." In almost every instance of the kind there depended from the limestone roof, vertically over them, a long, slender, quill-like tube of Stalactite, occasionally reaching and uniting with a Pap. Such tubes occurred also in certain places where there were no Paps, and in some spots there was quite a forest of them, extending from the roof to the Stalagmitic Floor, where the interspace was not more than a foot. Wherever it was possible to excavate the deposit beneath without breaking them, they were left intact. In some cases the Granular Stalagmitic Floor, or the Cave-earth where it was bare, reached the roof; and where this was not the case, the unoccupied space was rarely more than a foot in height.

About midway in the Second Reach there was on each wall a remnant of the Crystalline Stalagmite, about 8 inches above the Granular Floor, fully 6 inches thick, about 6 feet in length, and within a few inches of the roof.

The mechanical deposit in the Passage was the ordinary Cave-earth, in some places sandy, but occasionally a very compact loam. It contained a considerable number of angular fragments of Limestone, numerous blocks of Crystalline Stalagmite, and a few well-rolled pebbles of Quartz, red Grit, and Flint. The masses of Limestone were not unfrequently of considerable size; indeed one of them required to be blasted twice, and another three times, in order to effect their removal; and some of the blocks of Stalagmite contained fully 15 cubic feet.

From the Entrance of the First Reach to about 10 feet within it, the upper surface of the Cave-earth was almost perfectly horizontal; but from the latter point it rose irregularly higher and higher, until, at the inner end of the Second Reach, the increased height amounted to about 9 feet. There were no tunnels or burrows in the deposit, such as occurred in both the Sally-Ports, and were described in the Fifth and Sixth Reports. Near the inner end of the Second Reach the Cave-earth adjacent to the walls was cemented into a concrete.

The deposit in the lateral ramifications of the Passage was the same typical Cave-earth, containing blocks of Crystalline Stalagmite and angular pieces of Limestone, but without any Granular Stalagmitic Floor.

It was stated in the Sixth Report (see p. 287 above) that at the third External Entrance, *i.e.* the first of the Low-level series, the deposits were of two kinds—the ordinary Cave-earth, with the usual osseous remains, below; and small angular pieces of Limestone, with but little earth and no fossils, above. Materials of precisely the same character, and in the same order, were found at the second low-level Entrance at the eastern end of the Second Reach of Smerdon's Passage.

Besides a large number of bones, portions of bones, and fragments of antlers, a total of fully 2900 teeth were found in the Passage and its ramifications, of which 700 were reported in the Sixth Report. (See p. 288 above.) The remaining 2200, exhumed between the end of August and the end of December, 1870, belonged to different kinds of animals in the ratios shown in the following Table:—

TABLE IV.—Showing how many per thousand of the Teeth found in the Cave-earth, in Smerdon's Passage and its Rami-

fications, from 31st August to 31st December, 1870, belonged to the different kinds of Mammals.

	Per thousand.		Per thousand.
Hyæna . . .	335	Bear . . .	18
Horse . . .	295	Fox . . .	12
Rhinoceros . . .	161	Lion . . .	6
Megaceros . . .	55	Reindeer . . .	5
Ox . . .	35	Wolf (?) . . .	4
Deer . . .	27	Bat . . .	2
Badger . . .	22	Rabbit . . .	1
Elephant . . .	20	Dog (?) . . .	less than 1

On comparing the foregoing list with those given for the two Sally-Ports in the Sixth Report (pp. 278 and 285), it will be found to differ from them in containing neither Sheep nor Pig, and in the diminished prevalence of Rabbit and Badger.

Many of the teeth were in fragments of jaws, having in most cases lost their condyles and inferior borders. They belonged to individuals of all ages, from a baby Elephant (No. 5379), found in the first Foot-level of Cave-earth, 8th September, 1870, whose molar crown was no more than .8 inch long, and a Hyæna, whose second set had made their appearance before the dislodgement of the first, to the wasted remnant of an adult tooth of a Mammoth, and the canine of a Bear worn quite to the fang.

Many of the bones and teeth were discoloured, a large number gnawed (generally, no doubt, by the Hyæna, but occasionally by some small animal), and a considerable proportion of them, at all the Levels, more or less covered with films of stalagmitic matter. On some of the specimens were markings produced probably by fine rootlets of trees having grown round them. Indeed, some thus marked had living rootlets surrounding them.

Coprolitic matter was very rare, only one example of it having been met with in the entire Passage.

Considerable heaps of bones of small animals, sometimes agglutinated, were found here and there on the surface of the deposit or but little below it. In one instance as many as 8400 were picked out of 120 cubic inches of material.

At the junction of the two Reaches of the Passage, a large ledge or curtain of Limestone projected downward from the roof considerably below the usual level. On the inner or northern side of it there were found bones, fragments of bones, and teeth, of a considerable variety of animals, all huddled together, and sufficient to fill a wheelbarrow.

Smerdon's Passage and its Branches contained 78 Foot-parallel of Cave-earth, and, it being necessary to excavate to the depth of 5 feet, a total of 390 distinct foot-levels (to say nothing of the excavation having been carried to a depth of 6 feet in a few Parallels, in order to pass under the Limestone Curtain just mentioned). The teeth were distributed in the Cave-earth as shown in the following Table:—

TABLE V. Showing the Distribution of the Teeth of the kinds of Mammals in the various Parallels and Levels in Smerdon's Passage and its branches.

	Hyæna.	Horse.	Rhinoceros.	"Irish Elk."	Ox.	Deer.	Badger.	Elephant.	Bear.	Fox.	Lion.	Reindeer.	Wolf (C)	Bat.	Rabbit.	Dog (C)
Parallels . .	71	68	60	29	43	23	14	27	29	14	11	11	9	1	2	3
1st Levels . .	44	44	32	10	16	9	11	10	6	3	...	1	1	1	2	
2nd " . .	53	51	42	11	23	7	2	11	9	5	4	1	2	...	...	1
3rd " . .	43	37	33	16	13	7	2	9	10	4	6	4	4	...	...	2
4th " . .	29	28	22	9	13	7	...	5	5	4	2	5	3	...	...
5th " . .	19	16	10	3	6	3	...	5	4	2	1	3	...	...	...
Total Levels .	188	176	139	49	71	33	15	40	34	18	13	14	10	1	2	3

By way of explanation, it may be stated that teeth of Hyæna, for example, were found in 71 of the 78 Parallels, at all levels, and in 188 distinct Foot-levels, or very nearly one half of the total number; and so on for the other kinds of animals.

The Table shows at a glance that, in the case of the most prevalent animals—Hyæna, Horse, and Rhinoceros—their teeth were most frequently met with (not necessarily met with in greatest numbers) in the second Foot-level, below which they were less and less frequent as the Level was lower; that the Badger was most frequently met with in the uppermost Foot-level and never found below the third; that teeth of Lion were not found in the uppermost Level, and occurred most frequently in the third; that those of Wolf did not present themselves in the lowest or fifth Foot-level; that Bat and Rabbit were restricted to the uppermost Level, the former to one Parallel and the latter to two; and that the Hyæna had the widest distribution, both as regards Parallels and Levels.

Thirteen Flint and Chert flakes and chips were found in the

Second Reach of the Passage—3 in the first or uppermost Foot-level, 3 in the second, 3 in the third, and 4 in the fourth; there were none in the First Reach, or in the lateral Branches. Compared with the fine specimens met with in previous years in other parts of the Cavern, they are perhaps of but little value. With one exception (No. 3554)—a well-designed but roughly finished lanceolate implement—they are all of the prevalent white colour.

In the Second Reach there was also found a lance-shaped bone tool (No. 3428), 2·7 inches long, 1·1 inch broad at the but-end,—flat on one face and uniformly convex on the other, reduced to a thin edge all round the margin, except at the but-end,—where it was cut off sharply but somewhat obliquely—tapering gradually to a rounded point, and ·4 inch in greatest thickness. In short, it closely resembled in form and size many of the lanceolate Flint Implements of the Cavern series, with the single exception that it was not carinated on the convex face. It was found on October 5th, 1870, in the first Foot-level of Cave-earth, lying with 6 teeth of *Hyæna*, 1 of *Rhinoceros*, 1 of *Bear*, 1 of *Horse*, 1 of *Cervus megaceros*, 2 jaws of *Badger* containing four teeth, bones and fragments of bone, some of which were gnawed and some invested with films of stalagmite.

It has been already stated that, at its eastern extremity, the second Reach of Smerdon's Passage terminated in a low-level External Entrance, filled with true Cave-earth below, above which lay an accumulation of small angular stones with but little earth. In the Cave-earth the ordinary mammalian remains were found, including teeth and bones of *Hyæna*, *Horse*, *Rhinoceros*, *Cervus megaceros*, *Ox*, *Elephant*, *Bear*, and *Reindeer*; but the only thing met with in the materials above was an Amber bead (No. 3385), ellipsoidal in form, but somewhat thicker on one side than the other, ·9 inch in greatest diameter and ·5 inch in least, and having at its centre a cylindrical perforation about ·2 inch in diameter. It was found 26th September, 1870.

The excavation of Smerdon's Passage was completed on December 31st, 1870, very nearly five months having been expended on it. From its prevalent narrowness, the labour in it had been attended with much discomfort; but probably no branch of the Cavern had, on the whole, yielded a larger comparative number of mammalian remains.

Minor Ramifications of the North Sally-port.—It was stated in the Sixth Report (see p. 286 above), that there were one

or two ramifications of the North Sally-Port which had not been excavated, having been passed intentionally in the progress of the work. To these attention was given on the completion of Smerdon's Passage.

The first was a small opening in the east wall of the last Reach of the North Sally-Port, and had its Limestone floor very slightly above the top of the deposit in that Reach. It proved to be a tunnel in the Limestone, having a rudely triangular transverse vertical section, from 2.5 to 3 feet in height and breadth, and extending eastwards, or outwards towards the hill-side, for about 8 feet, where it terminated in material of the same character as that found above the Cave-earth in the First and Second low-level External Entrances, from the first of which it was about 12 feet distant. There is no doubt that it is a third of these low-level Entrances, and, to use the time-honoured phraseology in descriptions of Kent's Hole, it may be termed the "Oven Entrance." It contained but little deposit, and the only noteworthy objects found in it were one tooth of Horse, a few bones and bone fragments, and a grit pebble.

The second of these small lateral Branches was in the south wall of the immediately preceding, or penultimate, Reach of the Sally-Port, and was too narrow to admit of being excavated in Parallels and Levels. In it were found 7 teeth of *Hyæna*, 10 of Horse, 3 of Rhinoceros, 1 of Bear, 1 of Lion, 1 of *Cervus megaceros*, 1 of Ox, 16 of Badger in parts of 4 jaws, 10 of Rabbit in parts of 2 jaws, portion of an antler, a right femur of Beaver, bones and fragments of bone, a bit of charcoal, and a grit pebble. It is noteworthy, perhaps, that the fine specimen of Beaver's jaw mentioned last year (See p. 285 above) was found about 4 or 5 feet from the femur just named.

The third and last of these lateral Branches was near that part of the Sally-Port termed the Islands. (See p. 281 above). It yielded 2 teeth of *Hyæna*, 1 of Horse, 3 of Rhinoceros, 1 of Bear, 3 of *Cervus megaceros*, 4 of Deer, 2 of Badger, 4 of Rabbit, an astragalus of Ox, bones and bone fragments, and, in the uppermost Foot-level, 2 land-shells.

On January 17th, 1871, the workmen finally and gladly emerged from the labyrinth of low narrow passages in which they had been engaged from day to day from November 13th, 1869, or upwards of 14 months. In this time they had not only excavated and taken to the day the deposits, to the depth of 5 feet, in all the extensive and ramifying Branches known as the North Sally-Port and Smerdon's Passage, and

exhumed cartloads of the remains of various animals, including 5900 of their teeth, as well as 20 Flint Implements and flakes, but, beyond the first Reach of the Sally-Port (27 feet long) they had actually discovered the whole of these Branches, including three new Entrances to the Cavern itself, and had thus added greatly, not only to the extent of Kent's Hole, but to a knowledge of its character.

The completion of these Branches concluded the excavation, to the depth of 4 feet generally, and 5 and even 6 feet in some instances below the Granular Stalagmitic Floor, of the whole of the Eastern Division of the Cavern.

The Cavern Entrances.—Before proceeding to a description of the portion of the Cavern which next engaged attention, it may be of service to devote a few words to the Entrances, of which there are now known to be five (two at a high and three at a low level), all in the eastern side of the hill, and within a horizontal distance of 54 feet. Those at the high-level (known from time immemorial) are about 54 feet apart, almost exactly on the same level, and about 189 feet above mean tide. The most northerly of them is that invariably spoken of in all early descriptions of the Cavern as "The Entrance." Those of the lower series are also at very nearly the same level with one another, but from 18 to 20 feet below the former two. Being lower in the sloping hill-side, they are about 24 feet outside, or east of, the vertical plane passing through the higher Entrances. The most southerly ones in the two series are nearly in the same east and west vertical plane.

In order to distinguish them, they are respectively termed :—

1. "The Entrance," = the more northerly of the upper series, and, from its form, sometimes termed the "Triangular Entrance." It opens into the Vestibule.

2. The "Arched Entrance," = the more southerly of the upper series. It opens into the Great Chamber.

3. The "First Low-level Entrance," = the middle one of the lower series—the first discovered by the Committee. It opens into the North Sally-Port and the First Reach of Smerdon's Passage.

4. The Second Low-level Entrance, = the most northerly of the lower series—the second discovered. It opens into the Second Reach of Smerdon's Passage.

5. The "Oven Entrance," = the most southerly of the lower series—the last discovered. It opens into the North Sally-Port.

The Sloping Chamber, resumed.—That portion of the Cavern termed the Sloping Chamber by Mr. Mac Enery was, before the Committee's exploration of the Great Chamber, the largest apartment in it, and is still, perhaps, more calculated than any other to impress visitors. It is the only available connexion of the two great Divisions of the Cavern, measures 80 feet from east to west, 25 in greatest breadth, and, since the excavation of its deposits to the depth of four feet below the base of the Granular Stalagmitic Floor, 25 in greatest height. Its name was derived from its Floor, which, from 20 feet from its eastern wall, sloped rapidly towards its western side, falling as much as 14 feet in 60, or at an average angle of $13^{\circ}5$. Its ceiling sloped more rapidly still, being, as already stated, 25 feet high near the eastern wall, but not more than 6 feet at the western. This ceiling, though representing the dip of the Limestone strata in a general way, is extremely rugged,—here retreating into deep cavities whence huge masses of Limestone have fallen, and there ornamented with numerous and heavy masses of Stalactite. Indeed the finest known Stalactites in the Cavern occur in it; and one termed the Chandelier has always been much admired. A very strong light is required, however, to bring out all the features of the ceiling.

During the autumn of 1866, the upper, or eastern, or level portion of this Chamber was explored, and the results were described in the Third Report. (See p. 217 above). Mr. Mac Enery, too, had made extensive, no doubt his most extensive, diggings near the foot of the incline, where he "succeeded in sinking a shaft to the depth of 30 feet at the bottom of the slope, with the view of reaching the original Floor" (see *Trans. Devon. Assoc.* iii. 248), which, however, was not realized. Having broken the Floor for his shaft, and finding the work very laborious, he availed himself of the opening thus made to extend his diggings eastward, keeping just beneath the Granular Stalagmitic Floor, which he left spanning his broken ground like an arch.

As it was obvious that a very considerable amount of deposit still remained there intact, it was decided, on the completion of Smerdon's Passage, to resume the excavation of this Sloping Chamber, not only in the hope of obtaining some of the palæontological treasures with which it abounded, according to Mr. Mac Enery, but also as a pre-requisite to the exploration of the "Wolf's Den" and the "Long Arcade," into which it opened on the north and south respectively.

The uppermost deposit, as in the adjacent parts of the Cavern, was the Black Mould so frequently mentioned in previous Reports; and as the Chamber was the only capacious apartment near the Entrance, and the only road to the Western Division of the Cavern, which, from some cause, seems to have been more attractive than the Eastern to visitors in, at least, recent times,* it might have been expected that many comparatively modern objects of interest would have been found in the Mould. In reality, however, such objects were by no means abundant—a fact explicable, perhaps, on the hypothesis that they had been collected by Mr. Mac Enery and other early explorers. The only things found in this deposit (which, it may be stated, was of inconsiderable depth) were shells of Cockle, Limpet, and Pecten; two Potsherds—one black and of coarse clay, the other brown, in which the clay was finer; a Flint chip and a Core of the same material; a Spindle-Whorl of fine-grained micaceous Grit, 1·5 inch in diameter, ½ inch in thickness, and having its external edges rounded off; and a bone Awl, 3·7 inches long, ⅞ inch broad at the but-end, and partially covered with a film of Stalagmite.

Beneath the Black Mould came the ordinary Floor of Granular Stalagmite, in which, as well as in the deposit beneath, the rugged character of the ceiling suggested that a considerable number of large masses of Limestone would be found. Their presence in the floor, moreover, was indicated by the nature of its upper surface, which, though a continuous sheet, with one exception to be noticed hereafter, was so very uneven as to induce an early guide to the Cavern to confer on it the appellation of the "Frozen Billows." (*Trans. Devon. Assoc.* iii. 247.) Accordingly, the Floor proved to be, with an exception here and there, a concreted mass composed of large and small pieces of Limestone and blocks of the well-known Crystalline Stalagmite, all cemented together and covered with a sheet of the Granular Stalagmite.

Near the upper part of the slope, and on its southern margin, a space about 14 feet long and varying from 3 to 12 feet broad was without any trace of Stalagmitic Floor, but occupied with large loose pieces of Limestone. Elsewhere

* The following fact seems to be confirmatory on this point:—There are in the various branches of the Western Division (sometimes in places of difficult access) numerous initials and dates on the Limestone walls and on bosses of Stalagmite—some engraved, some smoked, and some merely chalked—while there are extremely few in the Eastern Division.

the sheet was perfectly continuous until reaching the area in which Mr. Mac Enery had dug his shaft. The Floor commonly measured from 12 to 30 inches in thickness, but adjacent to the southern wall it was fully 3 feet and contained few or no stones.

On being broken into small pieces and carefully examined, it was found to contain 2 teeth of Horse, a portion of a jaw, 2 bones, and half of a fractured Flint nodule. About 30 feet down the slope, a series of dark parallel lines were observed in the Floor, the uppermost being about 2 inches below the upper surface. On the advance of the work, they proved to be continuous downward, and to have a greater and greater thickness of Stalagmite over them. On careful examination, it was found that each represented what for a time had been the upper surface of the Stalagmitic Floor of the Chamber, and was due to the presence of comminuted charcoal and other dark-coloured extraneous matter. Such a "Charcoal Streak" also occurred, according to Mr. Mac Enery, in the "Long Arcade," within a few feet of the same spot. (See *Trans. Devon. Assoc.* iii. 236, 261, 262.) The workmen were directed to detach a specimen of the Floor where the streaks were well displayed, and in doing so were so fortunate as to make their fracture at a place where a large Cockle shell lay firmly imbedded in the lowest streak, at a depth of about 8 inches below the surface. Whilst splitting up the Stalagmite on May 16th, 1871, two specimens of well-marked Fern impressions were found in it, about 3 inches below the surface. Nothing of the kind had ever been noticed before during the present exploration.

Below the Granular Stalagmite, as usual, lay the Cave-earth, in which, as was anticipated, pieces of Limestone were unusually abundant. Some of them measured several feet in length and breadth, and were fully 2 feet thick. There were also numerous blocks of Crystalline Stalagmite, measuring in some instances upwards of 4 cubic yards, and not unfrequently projecting from the Cave-earth into the overlying Granular Sheet. Though they were carefully broken up, nothing was found in them.

In that portion of the Cave-earth which was found intact, there occurred, as usual, remains of the ordinary Cave-mammals, including about 550 teeth, which may be apportioned as in the following Table:—

TABLE VI.—Showing how many per cent. of the teeth found in the Sloping Chamber belonged to the different kinds of Mammals:—

	Per cent.		Per cent.
Hyæna . . .	39	Reindeer . . .	2
Horse . . .	28·5	Ox . . .	2
Rhinoceros . . .	14	Elephant . . .	1·5
Deer . . .	4	Lion . . .	1
"Irish Elk" . . .	2·5	Wolf (?) . . .	1
Bear . . .	2·5	Dog (?) only one tooth.	

It is, perhaps, worthy of remark that though wild animals still frequent Kent's Hole, and there is reason to believe that some of them have in recent times carried in the bones of others on which they preyed, though the Sloping Chamber is near and between the two high-level Entrances, though the Floor was broken up and thus gave the readiest access to the Cave-earth, and though Mr. Mac Enery discontinued his labours upwards of 40 years ago, of which more than 30 were years of quietude in the Cavern, there is in the foregoing list not only neither Sheep nor Pig, but no trace of Badger, Rabbit, Hare, or Vole, all of which have been found in other parts of the Cavern, in deposits accessible to burrowing animals.

In the Cave-earth there were also found 52 Flint Implements, flakes, and chips—3 of them in the first or uppermost Foot-level, 16 in the second, 15 in the third, and 18 in the fourth or lowest. Though none of them were equal to the best the Cavern had yielded in previous years, there were some good lanceolate Implements amongst them.

No. 3693 was of light brown translucent Flint, 1·85 inch in length, ·9 inch in greatest breadth, ·175 inch in greatest thickness, nearly flat on one side, and carinated on the other. It was found February 9th, 1871, with a few bones in the first Foot-level, amongst loose stones, where there was no Stalagmitic Floor over it; hence it may be doubted whether it belongs to the Palæolithic series—a doubt strengthened by the modern aspect of the implement.

No. 3754, of the usual white Flint, 4·2 inches long, ·9 inch in greatest breadth, ·3 inch in greatest thickness, both longitudinally and transversely concave on one side, had a medial ridge on the other, from which, at about an inch from one end, a second ridge proceeded, and had a thin but uneven edge. It was probably pointed at each end, but had unfortunately been broken at one of them. It was found on March 6th, 1871, in the second Foot-level, with splinters of bone, beneath the Granular Stalagmitic Floor 18 inches thick.

No. 5430, also of white Flint, somewhat irregular in form,

but rudely lanceolate; 2·7 inches in length, 1·5 inch in extreme breadth, ·3 inch in greatest thickness, slightly concave on one face and irregularly convex on the other, was found on March 30th, 1871, with 2 teeth of Horse, 1 of Hyæna, and fragments of bone, in the second Foot-level, without any Stalagmitic Floor over it.

No. 3732, a whitish Flint, 2·3 inches long, 1·1 inch in breadth, which was nearly uniform from end to end, slightly concave on one face, convex on the other—on which there were three slight, parallel, longitudinal ridges—sharply truncated at both ends, but primarily thin at the sides. It was found on February 27th, 1871, in the third Foot-level, with a tooth of Hyæna and fragments of bone, without any Stalagmitic Floor over it.

No. 5435, a slightly mottled white Flint, 2·1 inches long, 1·1 inch broad, ·4 inch in greatest thickness, flat on one face, strongly ridged on the other, abruptly truncated at one end, but thin everywhere else, and retaining its width almost to the opposite bluntly-rounded end. It was found on 31st March, 1871, with a portion of Deer's jaw and fragments of bone, in the third Foot-level, beneath the Granular Stalagmitic Floor 2 feet thick.

No. 3687, a mottled Flint with white prevailing, 2·6 inches long, 1·2 inch in greatest breadth, ·3 inch in greatest thickness, broadest near the middle whence it tapered in both directions, somewhat pointed at one end, nearly flat on one face and convex on the other, on which there were two ridges—one subcentral and the other nearly marginal. It was found on February 7th, 1871, in the fourth or lowest Foot-level, with 1 tooth of Horse, 1 of Hyæna, and a fragment of bone, without any Stalagmitic Floor over it.

In this connexion may be mentioned a piece of calcareous spar, No. 3761, which appeared to have been used as a polishing-stone. It was found March 8th, 1871, with 2 teeth of Hyæna, 2 of Horse, 3 of Rhinoceros, gnawed bones, and a Flint flake, in the fourth Foot-level, having over it the Granular Stalagmitic Floor 18 inches thick. No such specimen had been noticed before.

A piece of burnt bone was found on the 22nd of the same month, with fragments of bone and faecal matter, in the second Foot-level, having the Granular Stalagmitic Floor over it.

Mr. MacEnery appears to have excavated beyond the limits of his shaft, not only in an easterly direction, as has been already stated, but also, at least, north and south of it.

So far as can be determined, the shaft was first sunk, and the excavated material lodged between it and the western wall of the Chamber, after which he undertook what may be called the adjacent horizontal diggings, and filled up the shaft with a portion of the excavated matter, thereby rendering it impossible to determine the exact site of the shaft itself. He does not appear to have taken outside the Cavern any portion of the deposit in order to ensure its more complete examination; hence it was scarcely possible that all its contents could be detected. Indeed, when speaking of his researches in this Chamber, he says, "It was feared that in the ardor of the first search, facts of importance might have been overlooked. The mass of mould thrown up on the former occasion was therefore a second time turned over and carefully searched, but nothing new was brought to light." (*Trans. Devon. Assoc.* iii. 289.)

This mass the Superintendents decided on taking out of the Cavern, partly to facilitate the excavation of deposits certainly intact beyond, and also because it was thought likely to be lodged on unbroken ground. Though there seemed but little prospect of finding anything by subjecting it to a third search, such a search was nevertheless made, and did not go unrewarded. The heap, though mainly of Cave-earth, included fragments of the Granular Stalagmitic Floor and portions of the Black Mould, and yielded hundreds of bones and portions of bones (one having an artificial hole lined with stalagmitic matter), fragments of antlers, the largest fragment of an Elephant's tusk that the Committee had met with, 143 teeth of *Hyæna*, 153 of Horse, 45 of Rhinoceros, 27 of Deer including *Cervus megaceros* and Reindeer, 6 of Bear, 5 of Ox, 5 of Sheep, 3 of Elephant, 3 of Wolf (?), or of Dog (?), 2 of Fox, 2 of Pig, and 1 of Lion, a few marine shells, several fragments of black Pottery, 4 pieces of Stalagmite with Fern-impressions, and 13 flint Implements and flakes—all, with one exception, of the prevalent white colour, and two of them decidedly good specimens of the strongly ridged lanceolate forms. In short, the virgin soil, in some parts of the Cavern, had been less productive than was this mass which had been twice carefully searched, but in candle-light only.

As was thought probable, the mass of dislodged materials proved to be lying on ground which had never been broken. Between Mr. Mac Enery's shaft and the west wall of the Chamber there was a space of at least 17 feet; and at 14 feet from the wall the Cave-earth was found to have not

only the ordinary Granular Stalagmitic Floor overlying it, but to be deposited on another and older Floor of the same material, but which, instead of being Granular, was made up of prismatic crystals—possessing, in short, the characters both of position and structure of the Crystalline Floor found in the Lecture Hall and South-west Chamber, and described in the Fourth Report (see p. 231 above)—a remnant, *in situ*, of the Floor which had furnished the large blocks of Stalagmite found in the Cave-earth in the Sloping Chamber, as already stated. From the point where it was first seen, it was everywhere continuous up to the western wall. Its thickness was not ascertained; for though it was partially broken up in cutting the four-feet section, the bottom of it was not reached. No objects of any kind were found in it. Had Mr. Mac Enery's excavations been carried but a yard further west he must have encountered it, and would have had data sufficient to solve the problem of the blocks of Stalagmite which he so often found in the Cave-earth.

The Committee are most anxious to guard against the impression that, in any of the foregoing remarks, they have been unmindful of the service which Mr. Mac Enery rendered to science, or have the most remote wish to depreciate the value of his long-continued labours. Indeed, when they remember that the means at his disposal must have been very limited, and that he was among the pioneers in Cavern-searching, they cannot but feel that the extent and results of his investigations are richly entitled to the warmest praise.


They venture, however, to take this opportunity of stating that, in order to a thorough and satisfactory investigation, Cavern deposits should be excavated, not by sinking occasional shafts, but continuously in a horizontal direction, to a uniform depth not exceeding 5 or at most 6 feet at first; that the material should be carefully examined *in situ*, and then taken to daylight for re-examination. Through not following the first, Mr. Mac Enery failed to understand the exact historical order of the Cavern deposits; and through not being able to accomplish the second, he passed over many specimens calculated to have modified his conclusions, and which he would have been delighted to have found. For example, when speaking of the Sloping Chamber, he says, "The [Stalagmitic] crust is thickest in the middle . . . for opening the excavation, the same means were employed as to break up a mass of ancient masonry. Flint blades were detected in it at all depths, even so low as to come in contact

with the fossil bones and their earthy matrix, but never below them." (*Trans. Devon. Assoc.* iii. 247.) During the last six months, however, the excavations made in the same Chamber, and in the immediate neighbourhood of his, have brought forth Flint Implements from every Level of the Cave-earth to which the work has been carried, and they were actually found in greatest numbers in the lowest Levels. To this may be added the fact that in his heap of refuse-matter, which he had twice examined, there were, as has been already said, upwards of a dozen flint tools, such as he stated never occurred in the Cave-earth. Had the soil been examined in daylight, they could not have been overlooked; for, instead of being specimens of little value, they are better far than some of those which he figured; and it is but right to add that many of those found by the Committee were overlooked in the first or candle-light search.

Again, Mr. Mac Enery was keenly watchful for extraneous objects in the Granular Stalagmitic Floor; and, from his silence on the question, it may be safely concluded that he never saw Fern impressions in it; nevertheless his refuse-heap contained four small slabs of this Floor, in each of which was a well-marked Fern impression, requiring not additional manipulation, but simple daylight for detection. Indeed, every specimen of this kind was detected in daylight only.

The four slabs just mentioned, as well as the two found by the Committee in the Floor they broke up, were submitted to Mr. W. Carruthers, F.R.S., of the British Museum, who has kindly furnished the following note respecting them:—

"British Museum, 10th July, 1871.

"The ferns are specimens of *Pteris aquilina*, Linn., and have belonged to very luxuriant plants; they do not differ from those now growing in England. It is possible that the fragment  may be another species, but it is too imperfect to determine, and it may only be a barren portion of the *Pteris*, with shorter and broader pinnules than the other specimens.

(Signed) "WM. CARRUTHERS."

Returning for a moment to the Crystalline Stalagmitic Floor beneath the Cave-earth, it was observed that, like the Granular Floor, it had here and there on its upper surface conical bosses rising above its general level, and that there were corresponding protuberances vertically above them on

the upper Floor. The same fact had been noticed in the other portions of the Cavern where the two Floors occurred in the same vertical sections—a fact apparently warranting the conclusion that the drainage through the Cavern-roof underwent no important change of direction during the entire period represented by the two Stalagmitic Floors and the intervening Cave-earth. When to this it is added that such bosses are, at least in most cases, vertically beneath Stalactitic pendants on the ceiling, it may be further inferred that the ancient and modern lines of drainage are, in the main, identical.

The Wolf's Cave.—On the completion of the work in the Sloping Chamber, on July 11th, 1871, the excavation of the Wolf's Den, which opens out of its northern side, was begun. It was in this Den that Mr. Mac Enery found the canines of *Machairodus latidens*, which have excited so much attention. No trace of this Mammal has been met with during the present investigation up to this time.

EIGHTH REPORT. Read at Brighton, August, 1872. (See *Rep. Brit. Assoc.* 1872, pp. 28–47.)

The Wolf's Cave, continued.—That branch of the Cavern which extends in a northerly direction from The Sloping Chamber was, by Mr. Mac Enery, termed "The Wolf's Cave," and occasionally "The Wolf's Passage," "The Wolf's Grave," and "The Idol Cave." It received the last name from "a column of spar" which, "near its entrance, joined the ceiling and floor and obstructed the way," and "had a singular resemblance to a Hindoo Idol" (*Trans. Devon. Assoc.* iii. 243, 293); and the first, because, on the removal of this Column, it was found to have "covered the head of a Wolf, perhaps the largest and finest skull, whether fossil or modern, of that animal in the world." (*Ibid.* 243.)

Mr. Mac Enery seems to have been eminently successful in collecting specimens in the Wolf's Cave, for he states that "of the quantity and condition of the remains here it is scarcely possible to give a just idea without appearing to exaggerate. They were so thickly packed together that, to avoid injuring them, we were obliged to lay aside the picks and to grub them out with our fingers. . . . They were found driven into the interstices of the opposite wall, or piled in the greatest confusion against its side, with but a scanty covering of soil, and that of the finest and softest sand intermixed with greasy earth. To enumerate the amount of fossils collected from this spot would be to give the inventory of half

my collection, comprising all the genera and their species, including the *cultridens*. There were hoardes." (*Ibid.*) Here, too, he appears to have found all the remains of *Machairodus latidens* (known then as *Ursus cultridens*) the Cavern yielded him, which he states were five canines and one incisor. (*Ibid.* 369-370.)

When completely excavated to the depth of 4 feet below the base of the Granular Stalagmitic Floor, this Cave was found to extend nearly 70 feet in a north-westerly direction, and at its entrance, or junction with the Sloping Chamber, to be about 40 feet wide. At three yards inside the entrance it narrowed to about 20 feet, at 7 yards to 10 feet, and beyond this its general width was from 7 to 8 feet, the width being taken, here as elsewhere, at the top of the Cave-earth. Before the commencement of Mr. Mac Enery's diggings, the space between the Limestone Roof and the Granular Stalagmitic Floor could nowhere have exceeded 2 feet. Indeed, he states that when they first entered this Cave, he and his companions "crawled like tortoises." (*Ibid.* 292.)

At the entrance, the Roof was commonly fretted as if by the action of acidulated water; but here and there, and especially on the eastern side, its comparatively fresh and smooth aspect indicated what may be termed the recent fall of masses of Limestone from it—an indication confirmed by the presence of such masses, some of them of great dimensions, immediately below. At intervals throughout the entire length of the Cave transverse lines of fracture, or divisional planes, appeared in the Roof; some of them were close-fitting, but occasionally they had been corroded or fretted into cavities of rudely elliptical outline, from a foot to 2 feet in height. The largest of them measured 5 feet long and something less than 1 foot wide; its walls were much fretted, and numerous pipe-like Stalactites depended from its roof. Some of the holes were completely lined with Stalactite, while others were quite bare. There were no traces of Cave-earth in any of them.

The north-eastern wall of the Cave, from the entrance to nearly 30 feet within it, was a confused mass of large fallen blocks of Limestone. With this exception, the walls, as in the other branches of the Cavern, consisted of beds of Limestone *in situ*. They were not much fretted, their edges were all more or less angular, and they were here and there traversed by fissures corresponding with the divisional planes in the Roof.

From the considerable remnants left undisturbed by Mr.

Mac Enery, there was, no doubt, primarily a continuous Granular Stalagmitic Floor from end to end varying from 3 to 12 inches in thickness. In a large area at the south-eastern angle of the Cave this Floor had been left untouched, and was found to be in some cases fully 2 feet thick. Like that in a great part of the adjacent Sloping Chamber, of which it was a prolongation, it contained numerous large masses of Limestone and of the Crystalline Stalagmitic Floor.

Similar masses, of both kinds, were abundant in the Cave-earth in the area just mentioned; and in some instances the blocks of Limestone lay across one another with but little deposit between them, as if they had fallen after the accumulation of the Cave-earth had ceased. In a few instances the cavities or interspaces were not covered with Stalagmite, and some of them contained a few recent bones and other objects.

Omitting this south-eastern area, Mr. Mac Enery extended his researches quite to the innermost point of the Cave, and, with few exceptions, up to 13 feet from the entrance, had broken up and searched the entire deposit to a depth exceeding the Committee's four-feet sections. Within the point just specified, he contented himself with cutting a comparatively narrow trench, leaving the ground quite intact adjacent to, and a few feet from, the south-western wall, but, as before, carrying his excavations to a depth exceeding 4 feet. At 24 feet from the entrance, however, he dug to no greater depth than 2 feet, and very rarely exceeded this in the inner part of the Cave, thus leaving the Committee's third and fourth Foot-levels everywhere intact, besides the belt adjacent to the south-western wall, of which, as already mentioned, no portion was touched. This margin, it may be presumed, was left intact for the reception of the excavated material, none of it being taken out of the Cave.

The deposit the Committee found in the Wolf's Cave, whether disturbed or undisturbed, was well-marked Cave-earth, consisting of light red loam with about 50 per cent. of angular fragments of limestone. There were no traces of the Breccia, and, excepting the area in the south-eastern corner, already mentioned, no fragments of the Crystalline Stalagmitic Floor.

In proceeding to the objects found in the Wolf's Cave, it is obvious that nothing can be said about such as may have been on or in the Granular Stalagmitic Floor; they, if such there were, had no doubt been secured by the earlier explorers.

It has already been stated that there were occasional inter-spaces among the blocks of Limestone lying confusedly in the south-eastern portion of the Cave. In some of these, all sealed up with the Granular Stalagmite, shells of the common Pecten were found, amounting to a total of twenty-five. Most of them were large shells, and some were thickly incrustated with calcareous matter containing, in one or two cases, traces of charred wood. In one instance two, and in another five, shells were found fitted neatly into one another, and cemented together with carbonate of lime, thus leaving no doubt that man had not only packed them, but placed them where they were found. The fact that some of them were "dead shells," having *Serpulæ* attached to their inner surfaces, indicated, of course, that they were not at least in all cases taken to the Cavern because they contained an article of food, but probably sometimes as domestic vessels.

The undisturbed Cave-earth in this branch of the Cavern yielded a considerable number of the remains of the ordinary Cave-mammals, which may be distributed as in the following Table:—

TABLE VII.—Showing how many per cent. of the Teeth found in the Cave-earth, in the Wolf's Cave, belonged to the different kinds of Mammals.

Hyæna . . . 44·5 per cent.	Elephant . . 2·5 per cent.
Horse . . . 25 "	Lion . . . 1 "
Rhinoceros . . 15 "	Wolf (?) . . 1 "
Megaceros . . 3 "	Ox . . . 1 "
Bear . . . 3 "	Rabbit . . . 5 "
Deer . . . 2·5 "	Fox . . . only 1 tooth.

From what has been already stated, it is obvious that in the Wolf's Cave there were no continuous first or second Foot-levels intact, and that even the third and fourth were not everywhere met with. Confining attention to the twenty-one instances of each of the two latter which did occur in the same Parallels, the following Table will show the distribution of the teeth in them:—

TABLE VIII.—Showing the distribution of the Teeth of the different kinds of Mammals in the third and fourth Foot-levels of twenty-one Parallels of the Cave-earth in the Wolf's Cave.

	Hyæna.	Horse.	Rhinoceros.	Megaceros.	Bear.	Elephant.	Wolf (?)	Lion.	Deer.	Ox.
No. of Parallels containing teeth in 3rd Level	16	12	9	2	4	4	0	2	0	1
" " in 4th Level .	16	14	15	2	2	2	1	2	1	1
" " in both Levels	19	18	18	3	6	6	1	4	1	1
Total No. of teeth in 3rd Level . . .	63	24	11	13	4	4	0	2	2	1
" " in 4th Level . . .	68	29	21	3	2	2	5	2	0	1
" " in both Levels . . .	131	53	32	16	6	6	5	4	2	2

The following examples will serve to explain the Table:—Teeth of Hyæna occurred in the third Foot-level in 16 distinct Parallels, and in the same number in the fourth; but as they were met with in a total number of 19 Parallels only, it is obvious that in 13 instances ($= 16 + 16 - 19$) they occurred in both Levels, in the same Parallel.

Again, as the Table comprehends 21 Parallels, and teeth of Hyæna were found in 19 only, it follows that there were 2 Parallels ($= 21 - 19$) in which no such teeth presented themselves.

Further, a total of 131 teeth of Hyæna were exhumed in the 19 Parallels, and of these 63 were in the third Foot-level, and 68 in the fourth or lowest; hence the different Levels were almost equally rich, and on the average several teeth occurred in one and the same Level and Parallel.

To take another example:—Teeth of Bear were found in the third Foot-level in 4 Parallels, and in the fourth Foot-level in 2; but as they occurred in a total number of 6 Parallels, it is obvious that in no instance were they met with in both Levels in one and the same Parallel ($4 + 2 - 6 = 0$).

Again, as the Table comprehends 21 Parallels, and teeth of Bear were found in 6 only, it follows that there were 15 Parallels ($21 - 6 = 15$) in which no such teeth presented themselves.

Further, a total of 6 teeth of Bear were exhumed in the 6 Parallels, and of these 4 were in the third Level and 2 in the fourth or lowest; hence the third was the richest Level, if this slender evidence may be trusted; and the teeth occurred singly, no more than one having in any instance been found in the same Parallel.

It is, perhaps, noteworthy that while teeth of Rabbit and Fox occurred in the Wolf's Cave, as is shown in Table VII.,

they did not, according to Table VIII., present themselves in either the third or fourth Level.

As in previous years, the Committee have removed and examined the deposits excavated and thrown aside by Mr. Mac Enery. In the Wolf's Cave, as elsewhere, this material yielded a large number of the remains of the ordinary Cave-mammals, including about 350 teeth, which may be thus apportioned :—

TABLE IX.—Showing how many per cent. of the Teeth found in the disturbed material in the Wolf's Cave belonged to the different kinds of Mammals.

Hyæna . . 36	per cent.	Bear . . 1·5	per cent.
Horse . . 33·5	„	Deer . . 1·5	„
Rhinoceros . 19	„	Badger. . 1·5	„
Megaceros . 3	„	Ox . . }	less than 1 per cent.
Sheep . . 2	„	Lion . . }	

Though it would be utterly useless to compare Tables VII. and IX., since the latter includes teeth not only from all Levels, but possibly such as were lying *on* the Granular Stalagmitic Floor, as well, perhaps, as more recent introductions, it is not without interest to observe that even amongst the rejected or neglected specimens, as the case may be, as well as in the undisturbed Cave-earth in every branch of the Cavern, the most prevalent forms are Hyæna, Horse, and Rhinoceros, and that their relative prevalence is indicated by the order in which they have been named.

The bones and teeth presented much the same characters as those found in previous years. Thus, many of the latter were in jaws or fragments of jaws, destitute, as usual, of their condyles, and, in most cases, of the lower borders also. Most of the specimens had an almost white colour, but some were of a dark hue; some were more or less coated with Stalagmite, some broken, some split, and very few had escaped the teeth of the Hyæna. Amongst the finer and more remarkable specimens may be mentioned jaws of Hyæna, canines of Lion and Bear, a left lower molar of *Elephas primigenius*, part of left lower jaw of Rhinoceros, and a portion of a palate and both rami of the upper jaw of Megaceros.

One of the canines of Bear (No. 5537) was so peculiarly worn or cut, both on the crown and on the fang, and especially the latter, as to suggest the probability of human agency. It was found 21st July, 1871, in the third Foot-level of Cave-

earth, with another tooth of Bear, part of an antler, and bones. On account of its strange aspect it was forwarded to Mr. G. Busk, President of the Royal College of Surgeons, F.R.S., V.P.L.S., &c., a member of the Committee, who remarked on it:—"The Bear's canine (5537) is certainly very curiously worn if it be naturally so. The wearing of the crown part is possible enough, perhaps; but I cannot account for the apparently worn portion of the fang, which, of course, during life must have been protected from wear. But what could be the object of such an implement if it were manufactured? Perhaps a kind of gouge or chisel.—(Signed) GEORGE BUSK."

The Mammoth's grinder (No. 5575) was almost perfect. Its crown measured 6 inches in length and 2·5 inches in greatest breadth. It was found September 13, 1871, in the third Foot-level of Cave-earth, with 22 teeth of *Hyæna* in parts of 5 jaws, 2 of *Rhinoceros*, 1 of Bear, with several large bones and fragments of bone. The Bear's tooth just mentioned was a canine worn almost to the fang, which measures 1·7 inch in width.

The *Rhinoceros* jaw (No. 5562), which had lost its condyles, but not its lower border, contained 4 consecutive molars, and was quite the finest specimen of the kind met with by the Committee. It was found September 4th, 1871, in the third Foot-level of Cave-earth, with a tooth of Bear, bones, and fragments of bone.

The jaws and palate of *Megaceros* (No. 5646) contained 6 consecutive molars on the left side, and 5 on the right. This specimen was found October 10, 1871, in the third Foot-level of Cave-earth, with 1 tooth of *Rhinoceros*, 1 of *Megaceros*, 5 of Horse, 6 of *Hyæna* in parts of two jaws, bones, and splinters of bone.

Though Mr. Mac Enery was not so fortunate as to find any Flint Implements in the Wolf's Cave, the Committee met with 5; and 4 of them are amongst the best specimens the Cavern has yielded.

No. 5563 was a white lanceolate Implement, 2·8 inches long, ·85 inch broad, and ·2 inch thick. It had a strong subcentral longitudinal ridge on one surface, was slightly concave longitudinally and convex transversely on the other, reduced to an edge on both margins, rounded and rather blunt at one end, abruptly truncated at the other, and had apparently seen some service. It was found September 4th, 1871, in the fourth Foot-level of Cave-earth, with 1 tooth of Bear, 1 of *Rhinoceros*, 3 of *Hyæna*, 3 of Horse, and 1 of Ox.

No. 5571 was a pale grey Flint implement of delicate pro-

portions, 3·7 inches long, ·65 inch in greatest breadth, and ·1 inch in greatest thickness; longitudinally and transversely convex on one side, somewhat strongly concave lengthways, but slightly convex, in the direction of its breadth, on the other, had a long narrow oval form, three ridges on its convex side, a thin edge all round its perimeter except at one end which was rather blunt, and it did not appear to have been used. It was found September 9, 1871, in the third Foot-level of Cave-earth, with 4 teeth of Hyæna, 1 of Rhinoceros, 1 of Horse, 1 of Ox, and fragments of bone scored with teeth-marks.

No. 5592, a Chert implement, rudely quadrilateral in form, 2·5 inches long, 2·2 inches broad, ·6 inch thick, had apparently been used, and was found September 20, 1871, in the first Foot-level of Cave-earth, with 2 teeth of Horse and 1 of Rhinoceros.

No. 5602, a strongly-proportioned Chert lanceolate implement, 3·9 inches long, 1·1 inch broad, and ·4 inch thick, concave on one face, very strongly carinated on the other, truncated at one end, pointed but blunt at the other, and worked to an edge along its two margins. It was found September 22, 1871, in the fourth Foot-level of Cave-earth, with 4 teeth of Hyæna, 2 of Horse, 2 of Rhinoceros, and several fragments of bone.

No. 5656, a somewhat irregular ovoid Chert tool, unequally convex on its two faces, 4·2 inches long, 3·3 inches in greatest breadth, ·85 inch in greatest thickness; had been wrought to an edge around its entire circumference, but not elaborately finished; at one small part near its broader end a portion of the original surface of the nodule from which it was formed remained, and it had apparently been much used. It was found October 13, 1871, in the third Foot-level of Cave-earth, but without any bones or teeth in the same Yard. Three implements of the same type have been mentioned in previous Reports.

The Cave of Rodentia.—From the north-eastern corner of the Wolf's Cave, a passage, scarcely 5 feet long, about 5·5 high, and, where narrowest, not more than 5 feet wide, led into a chamber measuring about 25 feet from east to west, and 20 from north to south. It was termed the "Cave of Rodentia" by Mr. Mac Enery, who thus describes his researches in it:—"We now found ourselves in the midst of hundreds of Rodentia. Of their remains and dust the deposit was constituted, agglutinated together by calcareous matter

into a bony breccia. It should have been premised that the Stalagmite above them was about a foot and a half deep, regularly laminated, and free from all adventitious matter. . . . It suffered no disturbance or interruption from its first commencement. . . . The Remains of Rodentia were wanting in no part of the Cavern that we had yet examined . . . but here, in this grotto, they swarmed in countless multitudes. Not only had their tiny remains penetrated into every cleft and crevice of the rock, but they insinuated themselves even into the chambers of the large bones. The wolf's skull, in the passage, had its cavities charged and its surface incrustated over with a concretion of their bones. . . . It was an interesting spectacle to behold myriads of minute animal remains congregated by the side of Elephants, Rhiuoceroses, and Hyænas in a common sepulchre. Heads generally crushed; lower jaws preserved. When a handful of this dust was thrown into water, hundreds of teeth rose to the surface, and it was by this means they were collected." (See *Trans. Devon Assoc.* iii, 244, 245.)

It will be seen from the foregoing quotation that here, too, the Committee were following Mr. Mac Enery's steps. His labours, however, were on a less extended scale than in the Wolf's Cave. In the narrow trench to which he restricted himself, and which was not continuous, his excavations never extended more than 2 feet, and frequently not more than 18 inches, below the base of the Granular Stalagmitic Floor. Connected with this Cave, moreover, there proved to be two recesses, which he did not enter; indeed, he probably did not suspect their existence.

The Roof of the Cave of Rodentia slopes gently towards the north. Its general height above the bottom of the Committee's excavation is about 8 feet; and from this it varies but little, except in one or two places, whence masses of Limestone have recently fallen. The Roof is fretted, and has occasional flues extending tortuously upwards and from 9 to 12 inches in diameter at the bottom, where they are largest. None of them contain any stalactitic or earthy matter.

The walls of the Cave are but little fretted, and their edges but slightly rounded.

Almost immediately on entering the Cave the workmen had to blast a large mass of Limestone lying on the Stalagmitic Floor, and which in all probability deterred Mr. Mac Enery from breaking ground there. A few yards farther in, a portion of the south wall, certainly *in situ*, and without obvious indication of severance from the limestone stratum

of which it was a part, was found to project a few feet beyond the general direction, and to have Cave-earth beneath it. This underlying deposit had been regularly removed as the successive Parallels were excavated. At length the entire mass, estimated at a ton in weight, fell and very nearly crushed the foreman of the excavators.

The Granular Stalagmitic Floor, originally continuous across the entire length and breadth of the Cave, had in great part been broken up by the earlier explorers. Judging from the remnants of it still remaining it was of the ordinary Granular and laminated character, and from 3 to 12 inches in thickness.

Beneath this Floor the deposit was the common Cave-earth from top to bottom of the 4-feet sections, except in the northern corner of the Cave, where the Crystalline Stalagmitic Floor, *in situ*, formed its basis and rose boss-like from beneath.

In the excavated deposits thrown aside in this Cave by Mr. MacEnery, the Committee found bones and teeth as usual, and a bronze gouge 3·2 inches long, and ·75 inch in diameter at the end intended for the reception of the haft. There can be little or no doubt that it lay on the Stalagmitic Floor before Mr. MacEnery entered the Cave, and that he failed to observe it.

The only object found in the Granular Stalagmitic Floor was a fine *os innominatum* of Rhinoceros (No. 5743), met with 18th November, 1871.

In the intact Cave-earth about 1000 teeth of various kinds of mammals were met with, in the ratios shown in the following Table:—

TABLE X.—Showing how many per cent. of the teeth found in the Cave-earth in the Cave of Rodentia belonged to the different kinds of Mammals.

Hyæna . . . 44	per cent.	Reindeer . . 1·5	per cent.
Horse . . . 28	"	Elephant . . 1	"
Rhinoceros . . 9·5	"	Lion . . . 1	"
Megaceros . . 4	"	Sheep . . . 5	"
Deer . . . 4	"	Fox . . . 1	tooth only.
Bear . . . 3	"	Wolf (?) . . 1	tooth only.
Ox . . . 2	"		

In certain parts of this Cave the Cave-earth was found intact in every Level; in others the uppermost Foot-level only had been broken, leaving the second, third, and fourth undisturbed; while in a third area the two lower Levels

alone were untouched. The second group occupied an area of but limited extent, and needs no further notice, but the distribution of the teeth in the first and third are shown in the following Tables:—

TABLE XI.—Showing the distribution of the Teeth of the different kinds of Mammals in each of the four Foot-levels of thirteen Parallels of the Cave-earth in the Cave of Rodentia.

	Hyaena.	Horse.	Rhinoceros.	Megaceros.	Bear.	Elephant.	Lion.	Deer.	Ox.	Reindeer.	Sheep.
No. of Parallels containing teeth in 1st Level	3	3	2	2	2	0	0	0	1	0	0
" " in 2nd Level .	8	9	5	0	5	1	1	4	0	1	1
" " in 3rd Level .	11	9	5	2	1	2	1	3	0	0	0
" " in 4th Level .	2	5	3	1	1	1	0	1	1	0	0
" " in all Levels .	13	11	8	5	7	3	2	6	2	1	1
Total No. of teeth in 1st Level . .	13	7	3	2	2	0	0	0	2	0	0
" " in 2nd Level . .	44	26	7	0	10	1	1	6	0	1	1
" " in 3rd Level . .	38	24	6	2	1	3	1	8	0	0	0
" " in 4th Level . .	6	17	4	1	1	1	0	2	1	0	0
" " in all Levels . .	101	74	20	5	14	5	2	16	3	1	1

TABLE XII.—Showing the distribution of the Teeth of the different kinds of Mammals in the third and fourth Foot-levels of fourteen Parallels of the Cave-earth in the Cave of Rodentia.

	Hyaena.	Horse.	Rhinoceros.	Megaceros.	Wolf (?)	Lion.	Deer.	Ox.	Reindeer.
No. of Parallels containing teeth in 3rd Level .	13	11	9	5	1	1	1	4	2
" " in 4th Level .	11	9	5	1	0	0	0	2	1
" " in both Levels	14	13	10	5	1	1	1	6	2
Total No. of teeth in 3rd Level . . .	64	39	18	11	1	1	1	7	3
" " in 4th Level . . .	63	25	7	2	0	0	0	2	1
" " in both Levels . . .	132	64	25	13	1	1	1	9	4

In the material which Mr. MacEnery had excavated, examined, and thrown aside in this Cave, about 130 teeth were found, which may be apportioned as in the following Table:

TABLE XIII.—Showing how many per cent. of the Teeth found in the disturbed material in the Cave of Rodentia belonged to the different kinds of Mammals.

Hyæna . . . 37	per cent.	Ox 3	per cent.
Horse . . . 31	"	Rabbit 3	"
Deer . . . 12·5	"	Reindeer . . . 1	tooth.
Rhinoceros . 8	"	Wolf (?) . . . 1	"
Bear . . . 3	"	Fox 1	"

It has already been mentioned that there were two recesses in this Cave into which Mr. Mac Enery did not enter. One, in the north-east corner, measuring 4 feet long by 4 feet broad, yielded 36 teeth of Hyæna, 5 of Deer, 4 of Horse, 4 of Rhinoceros, 2 of Ox, a portion of an Elephant's tusk, numerous bones, and one Flint flake. The other, in the opposite corner of the Cave, measured 9 feet by 8 feet, and was found to contain 161 teeth of Hyæna (many of them in parts of jaws all having lost their condyles), 107 of Horse, 40 of Rhinoceros, 16 of Deer, 10 of Bear, 8 of Megaceros (of which 5 were in part of a lower jaw), 5 of Elephant, 5 of Ox, 5 of Sheep, 4 of Lion, 1 of Fox, a great number of bones, balls of Coprolite, 1 flake of Flint and 2 of Chert.

The following are among the noteworthy specimens found in the Cave of Rodentia:—

Part of the left upper jaw of Bear (No. 5740), containing the last three molars, which were not much worn. This specimen was in a good state of preservation, and found November 18th, 1871, in the third Foot-level of Cave-earth, with 2 teeth of Hyæna, 1 of Lion, and 1 of Elephant.

Part of the right upper jaw of Bear (No. 5745), containing the last three molars, which were somewhat worn. This specimen, not well preserved, was lying with a portion of probably the same head in a corresponding condition, and containing 1 canine of great size. They were found November 20th, 1871, in the second Foot-level of Cave-earth, with 1 tooth of Hyæna.

A canine of Bear (No. 5749), much worn, and having a fang 5·1 inches in girth. It was found November 22nd, 1871, in the second Foot-level of Cave-earth, with 1 tooth of Horse.

Portion of an Elephant's tusk (No. 5764), measuring 10 inches long and 6·5 inches in girth—the largest specimen of the kind yet met with in the Cavern. It was partially invested with Stalagmite, to which a few small angular stones adhered, and on its surface there were teeth-marks of Hyæna. It was found November 27th, 1871, in the first Foot-level of

Cave-earth, with 2 teeth of Hyæna and gnawed fragments of bone.

A very small tooth of Elephant (No. 5774), with two diverging fangs, found December 2nd, 1871, in the fourth Level of Cave-earth, with 1 tooth of Hyæna and bone fragments. On account of its very small size and unusual fang it was forwarded to Mr. Busk, who furnished the following remarks on it:—"A milk-molar of *Elephas primigenius*. As this tooth is only one half the size of the tooth usually, but erroneously, regarded as the m.-m. 1, I consider that it represents the very rare occurrence of a true m.-m. 1. If not, it is the smallest tooth of the kind I am acquainted with, except in the Maltese dwarf elephants (*vide* my paper in *Zool. Trans.* vol. vi. pl. 53, fig. 2). The proper dimensions of m.-m. 2 in *Elephas primigenius* are about .8 inch \times .7 inch, and the smallest I have seen of *El. indicus* is .6 \times .48; whilst a tooth in the Zebbug collection is .4 \times .32, and the present one .45 \times .3, or nearly the same. One objection, however, and that a strong one, to the present tooth being really m.-m. 1, arises from its having two divergent fangs, while the Zebbug tooth has only one, or two connate into one. This is a very curious specimen, and, as regards the elephant, of remarkable interest."—(Signed) "GEORGE BUSK." [See "British Fossil Elephants," *Pal. Soc.*, by A. Leith Adams, M.A., M.B., F.R.S., &c., p. 84, and plate 9, fig. 4.]

Several good specimens of coprolite were met with in the Cave of Rodentia.

Five Implements and flakes of Flint and Chert were also found, but none of them ranked amongst the best of the Cavern series; indeed one only (No. 5741), required special description. It was a light grey Flint, rudely oval in form, irregularly convex on both faces, 2.8 inches long, 2.4 inches broad, and .95 inch in greatest thickness. Though it had undergone a considerable amount of chipping, and was reduced to an edge all round, it was by no means a well-finished, but was probably a very efficient, "scraper." It was found November 18th, 1871, with 5 teeth of Hyæna, 2 of Megaceros, 1 of Horse, and 1 of Rhinoceros, in the third Level of Cave-earth.

Besides the Implements, there was a piece of Chert having the form of a rudely triangular pyramid, 3.2 inches high, its scalene base being 3.3 inches long and 1.2 inch broad. It was found November 30th, 1871, with 2 teeth of Hyæna, 3 of Horse, and 1 of Ox, in the third Foot-level of Cave-earth. Its form was scarcely indicative of an artificial origin; and

though its edges were somewhat rounded, it did not seem possible for it to have been transported by natural agency from the nearest locality in which such material is now found *in situ*, without being much more rounded.

Before proceeding to another branch of the Cavern, the Committee would remark that they commenced their investigation of the Wolf's Cave on July 12th, 1871, and from that time until they had reached its termination, as well as that of its offshoot, the Cave of Rodentia, a period of nearly six months, they cherished the hope that, like Mr. Mac Enery, they might find some remains of *Machairodus latidens*. During their progress they were daily face to face with their energetic predecessor's labours, and from time to time met with the tools with which they were performed;* but they had finally to leave the two Caves on December 30th, 1871, with a feeling of great disappointment that neither amongst the many hundreds of specimens which Mr. Mac Enery had left in his broken ground, nor in the Cave-earth remaining intact beside and beneath his diggings, had they met with any trace of one great object and hope of their search.

Mac Enery states that he found the famous canines "in diluvial mud mixed with teeth and gnawed bones of Rhinoceros, Elephant, Horse, Ox, Elk, and Deer, with teeth and bones of Hyænas, Bears, Wolves, Foxes, &c." (see "Plate F," *Cavern Researches*, edited by E. Vivian, Esq., 1859), and that he subsequently discovered an incisor of the same species in the same bed. (*Trans. Devon. Assoc.* iii. 370) It will be seen from Table IX., given above, that, with scarcely any other exception than that of *Machairodus*, such an assemblage of remains as he enumerated was actually found by the Committee in the very soil which he had examined and cast aside; and from Table VII. that, of the animals in his list, just quoted, the great sabre-toothed *Felis* was the only one which failed to present itself when the Committee broke up the undisturbed Cave-earth lying below that which yielded the canines and incisor. When to this it is added that the most careful search by the Committee failed to detect in the Cave-earth which they excavated any remnant of the older Cavern deposit, and that Mac Enery was struck with the fact that, though "delicately edged," the canines "were found quite uninjured in the midst of the shattered bones" (*Ibid.* 294), a strong case seems to be made out in

* The tools were two hammers, a small chisel, a trowel, and an iron scraper. It cannot be necessary to state that these mementos of him who first made the Cavern famous have been carefully preserved.

favour of the propositions that *Machairodus* belonged to the Devonshire Cave-earth fauna, and that his remains found in Kent's Cavern were not redeposited fossils.

The Charcoal Cave.—Two passages open out of the south-west corner of the Sloping Chamber, opposite the Entrance of the Wolf's Cave. The more important is of great length, and leads in a south-westerly direction to a series of large chambers, in which the Committee have not yet undertaken any researches. Mr. Mac Enery designated this the "Long Arcade."

Very near its mouth is the Entrance of the second passage, to which, for a reason which will shortly appear, the Superintendents gave the name of the "Charcoal Cave." This the Committee proceeded to explore on completing the Cave of Rodentia.

It extends, on the whole, in a southerly direction for a distance of upwards of 50 feet, varying from 5 to 13 feet in breadth, and throughout the first half of its length maintaining a tolerably uniform height of from 9 to 10 feet. At 16 feet from the entrance it sends off a branch in an easterly direction, and at 26 feet a second branch towards the south-west; resolving itself, in short, into three passages, which ultimately reunite, and may conveniently be termed the "Northern," "Central," and "Southern Branches." They have all, but especially the Northern, the aspect of long-continued watercourses fretted by the subsequent and unequal action of acidulated water. Mouths of "flues" present themselves in the roofs and walls; but none of them have any traces of earthy matter, and few are lined with stalactite. The branches are subject to a very copious drip very soon after rains, but no portion of it enters through the flues just mentioned.

At 18 feet from the Entrance of the Cave a thin layer of black matter, among which Charcoal was conspicuous, was observed lying on the surface of the Granular Stalagmitic Floor, where it covered an area of about 2 square feet. It was thought at first to be probably the remains of a fire kindled by some recent visitors to the Cavern, though the place seemed an unlikely one for such a purpose, the roof being no more than 4 feet above the Floor before the excavation was made, and the narrow passage being very seldom entered by visitors. The whole of the material was carefully collected, and, on being washed and examined by the Secretary, yielded the following assemblage of objects:—

Small rough pieces of stalagmitic matter; bits of Charcoal, some of them incorporated in the stalagmitic matter just mentioned; upwards of a dozen small pieces of very coarse friable Pottery, of a reddish colour, without any trace of ornamentation, and in all probability parts of one and the same vessel; two unworn lower "wisdom teeth" of a Human subject; a few entire phalangeal bones, apparently of an individual barely mature; part of an ulna, of a pelvis, of a vertebra, of ribs, and numerous small fragments of bone; an almost perfect left lower jaw of a Fox, containing the canine tooth and five molars; a few incisors and bones of small Rodents.

In accordance with the practice invariably followed since the commencement of the exploration, the water in which the objects just mentioned were washed was passed through a fine sieve for the purpose of detecting minute objects of interest. This water was almost black from the fine matter held in suspension, and which, on being deposited and dried, proved to be fine silt coloured with charcoal.

As earlier explorers of the Cavern had in one place in this Cave attempted to break through the Stalagmitic Floor at a point farther in than the spot occupied by the black material, and must have frequently trampled on it, there is no difficulty in accounting for the broken condition of the pottery, the charcoal, and most of the bones. It is scarcely necessary to observe that the Charcoal Cave takes its name from the patch of black matter just described.

Mr. Charles Rodway, a distinguished dentist of Torquay, to whom the human teeth mentioned above were submitted, was so good as to furnish the following note respecting them:—

"Torquay, June 11th, 1872.

"MY DEAR SIR,—I have examined the two teeth you brought me, and they are right and left inferior '*dentes sapientie*' of a human being. They are the teeth of a subject between the age of 15 and 20 years, judging from the undeveloped state of the roots, which later in life would be longer, with the pulp-cavity at the apices considerably smaller. I notice upon the lingual surface of the left tooth what I take to be a deposit of salivary calculus, which leads me to suppose that they were already erupted from the gum, although not sufficiently risen to have been used in mastication, as the enamel on the masticating-surface does not appear to have been subjected to friction. It would be impossible to say whether they are the teeth of a male or female; but from their strong likeness they are unquestionably the teeth of the same person.

Yours truly,

(Signed)

"CHARLES RODWAY, S.D., Li. R.C.S."

With the exception of the jaw of Fox, and the incisors and bones of Rodents, all the osseous remains were believed by the Superintendents of the Exploration to be those of a Human subject of about the age indicated by the wisdom teeth, and were all forwarded to Mr. G. Busk, a Member of the Committee, who has furnished the following Report on them, confirming, with a few exceptions, their Human character. The specimens were twenty in all, and were numbered 1811, 1812, and so on.

MR. BUSK'S REPORT.

"No. 1811. Fragment of left ilium; probably female; age unascertainable.

"2. Not human.

"3. The sternal end of a human clavicle.

"4. First phalanx of third finger, right hand; entire, but with the epiphysal line of junction quite distinct; age 18 to 20.

"5. Portion of body of lumbar vertebra, showing that the epiphyses were ununited; age the same.

"6. A fragment of the sacrum.

"7. First phalanx of fourth finger, right hand, with the epiphyses detached.

"8. Second phalanx of right thumb.

"9. Upper end of right ulna, of rather peculiar form; the peculiarity consisting in the straightness of the posterior angle and the breadth of the square anterior face. Epiphyses quite united; but as this union takes place at 16 years, the bone probably belonged to the same individual as the above.

"10. Shaft of humerus (?) of — (?) Not human.

"11. Fragment of second right metacarpal.

"12. Distal portion of first metacarpal, or phalanx of thumb.

"13. Fragment of the shaft of a clavicle, of slender make.

"14. Fragment of the left ischium of a young ruminant of the size of the Ibex, or a large Goat; but may be by chance a young Red-deer—not Reindeer, nor Fallow-deer, nor Roebuck.

"15. Right cuneiforme bone.

"16. Right pisiform bone.

"17. First phalanx of fourth toe.

"18. Second phalanx of fifth toe.

"19. Third phalanx of third finger.

"20. Second phalanx of toe.

(Signed)

"GEORGE BUSK.

"32, Harley Street, July 29, 1872."

The Superintendents incline to the opinion that, since the age of the subject to whom Mr. Busk ascribes the bones harmonizes with that of the person to whom Mr. Rodway

says the teeth belonged, all the remains are portions of the same skeleton, and that they had been preserved in a cinerary urn of which the potsherds found with them were fragments.

There was a continuous Granular Stalagmitic Floor from the entrance of the Charcoal Cave to 19 feet within it, except at one place, where it did not quite extend from wall to wall. In the next 5 feet the Cave-earth was without any covering, but at 25 feet from the Entrance a Floor again presented itself. It was of the usual character, varied from 2 to 12 inches thick, and near the Entrance there was in it, about 2 inches below the surface, a thin layer of carbonaceous matter.

In the Northern Branch the Floor was everywhere continuous, and varied from 18 inches thick at the Entrance to 1 inch at the inner end. In the Central Branch the Floor was but partial, never exceeded 9 inches thick, and was occasionally no more than a mere film. In one or two instances pieces of Crystalline Stalagmitic Floor were incorporated in it. There was very little Floor in the Southern Branch.

Remnants of the Crystalline Stalagmitic Floor *in situ*, extending from wall to wall, presented themselves in each of the Branches, always at some height above the Cave-earth. They were indications, of course, of the former existence, and partial dislodgment, of a deposit older than the Cave-earth, and which there attained a higher level. The most considerable of them, in the Central Branch, was from 9 to 10 feet long, and 3 inches thick; its upper surface was 1.5 foot below the Limestone roof, and its lower surface 4 feet above the Granular Stalagmitic Floor, the spaces between it and the roof above, and the Granular Floor below, being quite unoccupied. The remnants in the other Branches differed from this in their measurements only.

With exceptions in portions of the Central and Southern Branches, to be noticed immediately, the mechanical deposit in the Charcoal Cave was true Cave-earth. At the Entrance, and for about 11 feet within, it contained an unusually great number of fragments of Limestone from top to bottom of the section. Beyond the point just specified, up to 18 feet from the Entrance, such fragments were rare except in the uppermost Foot-level, where they still abounded, their place below being taken by a few pieces of red Grit, some of which were fossiliferous, and the Cave-earth became very sandy.

From the first to the second bifurcation of the Cave, as well as for a few feet within each Branch, the Cave-earth was no more than from 1 to 3·5 feet deep, and rested on a continuous, but very uneven, Limestone Floor—an instance, and probably the only one yet known in the Cavern, of this Floor being reached.

In the Northern Branch the deposit was true Cave-earth throughout. In the Central one the Cave-earth contained a few pieces of Crystalline Stalagmitic Floor, and throughout the innermost 10 feet rested immediately on the dark red Breccia, found elsewhere in the Cavern beneath the Crystalline Stalagmitic Floor. In the Southern Branch nothing but true Cave-earth was found from the Entrance to 8 feet within it; but beyond that to the end, a distance of 17 feet, from the base of the section to 2·5 and even 3 feet above it, the entire accumulation was the dark red Breccia, rock-like in its cohesion, continuous from wall to wall, and clearly *in situ*.

It may be well at this point to give a brief recapitulation of the facts as they presented themselves in ascending, but not chronological, order, in the same vertical section, in the Central and Southern Branches:—

First, or Lowest. Dark red rock-like Breccia, at least largely composed of angular, sub-angular, and rounded fragments of Devonian Grit, derivable from the adjacent loftier hills, but not from the comparatively low one in which the Cavern occurs. Its depth is unknown, as its base has not been reached.

Second. Cave-earth, consisting of a somewhat light red loam and generally about 50 per cent. of angular fragments of Limestone, with an occasional pebble not derivable from the Cavern-hill. Its depth was variable, but never less than 1 foot.

Third. A Floor of Granular Stalagmite, from 1 to 18 inches thick.

Fourth. An unoccupied space from 1 to 4 feet high.

Fifth. A Floor of Crystalline Stalagmite from 3 to 4 inches thick.

Sixth. An unoccupied space from 1 to 3·5 feet high.

Seventh. The Limestone roof of the Cave.

Were we to speculate on the history of the Charcoal Cave as indicated in the facts just described, we should find ourselves taken back to the time when it was formed, not by any convulsion, but by the actual and probably gradual removal of the Limestone which once filled the entire space between

the walls, as is shown by the unfissured roof and the continuous Limestone floor.

Secondly, so far as can be ascertained, the introduction of angular, sub-angular, and rounded pebbles of dark red Grit, with sandy mud derived from their attrition, until the Cave and its Branches were filled almost to the roof.

Thirdly, the introduction of materials from without having ceased, the Breccia which had accumulated was hermetically sealed with a sheet of Crystalline Stalagmite from 3 to 4 inches thick—the result of the slow solution and precipitation of calcareous matter.

Fourthly, the Crystalline Stalagmite was partially broken up, and a portion of the Breccia dislodged, the removal being more complete in some parts than in others.

Fifthly, again there was introduced a mechanical deposit; but, instead of dark red Grit and sandy mud, light red loam and angular fragments of Limestone of various sizes were lodged in it. It did not attain to so great a height as the previous deposit of dark red material.

Sixthly, a Floor of Stalagmite, differing from the former in being Granular instead of Crystalline, was formed on the red loam of Cave-earth, at a lower level than that which sealed the Breccia.

Seventhly and lastly, this latter Floor being completed, there was placed on it a small cinerary urn containing Human bones and bits of Charcoal.

But to return. The deposits in the Charcoal Cave were by no means rich in osseous remains. The Granular Stalagmite yielded a few unimportant bones only, and in the Cave-earth there was but a comparatively small number of bones, and no more than 85 teeth. The latter belonged to different kinds of mammals in the ratios shown in the following Table:—

TABLE XIV.—Showing how many per cent. of the Teeth found in Cave-earth in the Charcoal Cave belonged to the different kinds of Mammals.

Horse . . . 33 per cent.	Bear . . . 3·5 per cent.
Hyæna . . . 29·5 „	Wolf (?) . . 2·5 „
Fox . . . 12 „	Elephant . . 1 „
Rhinoceros . . 10·5 „	Ox . . . 1 „
Badger . . . 6 „	Sheep . . . 1 „

There were but thirteen of the Parallels consisting of Cave-earth from top to bottom of the 4-feet sections which

contained teeth, and these amounted to no more than 31 in number. Their distribution is shown in the following Table:—

TABLE XV.—Showing the distribution of the Teeth of the different kinds of Mammals in each of the four Foot-levels of thirteen Parallels of the Cave-earth in the Charcoal Cave.

	Horse.	Hyæna.	Rhinoceros.	Bear.	Elephant.	Ox.	Sheep.
No. of Parallels containing teeth in 1st Level .	4	2	1	1	0	0	1
" " in 2nd Level .	2	2	0	0	0	0	0
" " in 3rd Level .	1	3	0	0	1	0	0
" " in 4th Level .	2	2	1	0	0	1	0
" " in all Levels .	7	7	2	1	1	1	1
Total No. of teeth in 1st Level	7	2	1	1	0	0	1
" " in 2nd Level	4	2	0	0	0	0	0
" " in 3rd Level	3	3	0	0	1	0	0
" " in 4th Level	2	2	1	0	0	1	0
" " in all Levels	16	9	2	1	1	1	1

The following may be mentioned among noteworthy bones found in the Charcoal Cave:—(No. 5906) The distal end of a tibia, an astragalus, and the proximal end of an *os calcis* of Horse, all inosculated in true anatomical position as when clothed with flesh, thus intimating that they were so clothed when lodged where they were found. The fractured end of the tibia as well as its oblique fracture afforded decided evidence of the powerful jaws of the hyæna. With these specimens were found another distal end of a tibia of Horse, a metatarsus of Horse, a metatarsus of Reindeer, part of an antler, a rather small astragalus, and a gnawed bone. They were lying but little below the surface of the Cave-earth, where it was not more than 1·5 foot deep, almost in contact with the roof of the Southern Branch; and were extracted June 6th, 1872, in the presence of the Secretary.

In a precisely similar situation, and but one foot from the objects just named, a metacarpus of Horse and a large atlas were found two days after.

On April 22nd, 1872, there were found on the surface of the Cave-earth upwards of 600 bones of rodents all lying together; and on the 11th of the same month, nearly 800 small Stalagmitic bodies, which may be likened to rather large,

ill-shapen, rugose marbles, were found in a heap on the Cave-earth, in a small recess in the wall of the Southern Branch, with two hazel-nut shells and a piece of bone. On May 17th a similar but smaller heap, containing about 100 such "marbles," with a toothless fragment of jaw, was met with in a position precisely like the former. Several coprolites were found in the Charcoal Cave.

One small flake of white Flint (No. 5899) was found in the Southern Branch on May 22nd, 1872. It may be dismissed with the remark that it lay in the first Foot-level of Cave-earth, with 2 teeth of *Hyæna*.

Bones and teeth were found in the Breccia in the Central and Southern Branches. The bones were much broken in digging them out, on account of the rock-like character of the Breccia. The teeth, like almost all those found in the same deposit in other parts of the Cavern, were all of them those of Bear.

In their Fifth Report the Committee called attention to a flake of Flint found in the Breccia in the Water Gallery, and pronounced by Mr. John Evans, F.R.S., a Member of the Committee, to be not only of artificial origin, but to have been used by man (see p. 265 above); and they ventured on the opinion that, from its being coeval with the Breccia (which must have been laid down long before the deposit in which, so far as the Cavern evidence goes, the first traces of the Cave-hyæna, Mammoth, and their contemporaries were met with), it was anthropologically by far the most important object the Cavern had then yielded. From that time the Committee have had no opportunity of investigating the Breccia, and hence no announcement of further discoveries of the kind were looked for in their Sixth or Seventh Reports. They are now, however, enabled to return to the subject, and to state that the Breccia has yielded two additional Flint Implements.

The first of these (No. 5900) was found May 22nd, 1872, in the Southern Branch, from 1 to 2 feet deep in the Breccia, in which it was firmly embedded; and over this was an accumulation of Cave-earth having no Stalagmitic Floor either above or below it. There were no bones found near the Implement; but vertically above it, in the Cave-earth, were the small flake of white Flint and the 2 teeth of *hyæna* just mentioned. The Breccia implement was rude in form, rather over 5 inches in greatest length, scarcely 3 inches wide, and about 1·5 inch in greatest thickness. It exhibited a

small portion of the surface of the nodule from which it was made, was of a dull cream colour, and its weight was less than that of ordinary Flints of the same size; in these respects resembling some of the tools found in the Windmill-Hill Cavern at Brixham.

All the dimensions of the second Implement (No. 5903) slightly exceeded those of that just described. Its colour was a pinkish cream; one of its surfaces was nearly flat, while the other was very convex, and retained much of the surface of the original nodule. The Secretary, who assisted to extract it, had the opportunity of studying it before any attempt was made to move it. The Breccia was compactly cemented together, and the implement firmly embedded in it, at 1 foot below its surface, above which was Cave-earth to the depth of 27 inches, and, without being covered with Stalagmite, reaching within 3 inches of the roof; in other words, the united thickness of the two deposits overlying the tool was 39 inches. It was distinctly observed to be fractured; and as the severed portions were in such close contact as to render the line of junction almost microscopic, it had obviously been broken where it lay. Every care was taken in its removal; but on being extracted it fell into three pieces, one of which remained firmly attached to and incorporated in a lump of the Breccia. The fractured surfaces showed that its colour was whitish throughout, and that its texture was Granular. It was found May 27th, 1872, in the Southern Branch of the Charcoal Cave, about 2 feet from the specimen just described (No. 5900), and, like that, had no bones near it.

The excavation of the Charcoal Cave and its branches was completed July 7th, 1872, the labour of 4·5 months having been expended on it.

The Long Arcade.—The principal passage opening out of the south-west corner of the Sloping Chamber, as already mentioned, was termed the Long Arcade by Mr. Mac Enery (*Trans. Devon. Assoc.* iii. 302), and the "Hyæna Cloaca Maxima" by Dr. Buckland (*Ibid.* 237). It has a direction towards the south-west, and is the great thoroughfare to the "Labyrinth," "Bear's Den," and "Cave of Inscriptions." Its exploration is at present in progress. Up to the end of July about ten weeks' work had been expended on it; but a very large amount remains to be done there. Mr. Mac Enery had commenced the exploration of the Arcade, but meeting with fewer fossils than he hoped, soon abandoned it. (*Ibid.* 290.)

At its Entrance this portion of the Cavern was about 17 feet

in width and 13 in height. The roof was the naked Limestone, much fretted or honeycombed. The Granular Stalagmitic Floor was continuous in every direction and of very great thickness. Its surface, for some distance, was occupied by a series of natural basins, bounded by Stalagmitic walls rising above the general level of the Floor. They varied in depth from an inch to fully a foot, and in wet seasons were constantly full of water. Similar basins occurred in other parts of the Cavern, but those at the mouth of the Arcade (the great thoroughfare) had attracted a large amount of attention. Mr. Mac Enery described them as "encircled with wavy walls, rivalling the most exquisite works in pastry." (*Ibid.* 236.) Charcoal was found in a few of them, and one contained two or three bones.

At the western wall of the Arcade, and several feet from it, the Granular Stalagmitic Floor was never less than 4, and not unfrequently upwards of 5, feet thick; but at the eastern wall it rarely measured more than 2 feet. The uppermost 6 inches were frequently of a dirty reddish colour, as if soil-stained; but at greater depths it was very pure, often Granular, occasionally flaky, and everywhere distinctly laminated.

At something more than a foot from the bottom of the Floor, there was found in every section a roughly horizontal continuous black line, extending from the western wall of the Arcade to a distance, in one instance, of 7 feet, generally about a quarter of an inch thick, but never exceeding half an inch. It was due to the presence of charcoal, and, of course, represented a thin sheet of that material. It was very carefully watched as the Floor was broken up, but yielded no trace of bone or of any substance besides the charred wood.

This "Charcoal Streak" was observed and studied by Mr. Mac Enery, who, attaching great chronological importance to it, described it no fewer than four times. (*Ibid.* 236, 261, 291, 335.) The portion of the Floor in which he found it was not more, at most, than half the thickness of that recently broken up by the Committee. From his description it appears to have been horizontal, midway from the surface to the bottom of the Stalagmite, from 1 to 2 inches thick, about 5 feet in greatest length in any section, composed of charred wood and straw, and to have contained the following objects embedded in it:—Small polished pebbles of white Flint, Shells, two portions of the jaw, a tusk, and some phalanges of Boar, the under jaw of a Badger, bones of Rabbits and Rats, and cylindrical bones which Dr. Buckland, who extracted them, assigned to Deer. The latter were half-

roasted, and, with the exception of the jaws of the Boar, all the bones had been more or less exposed to the action of fire. No extraneous objects of any kind were found in the Stalagmite above or below the Charcoal Streak.

The Committee have been more fortunate, having met with bones in other parts of the Granular Stalagmite, but all of them below the black line. The most noteworthy of these were a tooth of Deer (No. 5818), a large vertebra (No. 5951), and a well-worn tooth of Hyæna (No. 5969). In the same deposit a piece of black Flint (No. 5938) was found July 18th, 1872.

Mr. Mac Enery's diggings in the Cave-earth, at the Entrance of the Arcade, had in some places been carried to a depth of 3 feet below the Granular Stalagmitic Floor, thus leaving the fourth Foot-level intact. They gradually became less and less deep, until at 12 feet from the Entrance they ceased entirely. The excavated material on being carefully re-examined yielded very few specimens.

The deposit underlying the Granular Stalagmitic Floor was typical Cave-earth, having no peculiar characteristics. Up to the end of July, 1872, no trace of the Breccia had presented itself, either *in situ* or in incorporated fragments. The Cave-earth had not proved to be very rich, nor had it been remarkably poor in bones and teeth; and it had yielded two Flint Implements. It is believed, however, that the lack of abundance will be found to be fully compensated by the character and value of at least one of the specimens.

One of the Implements (No. 5819), a somewhat mottled white Flint, rather irregular in form, flat on one face, doubly carinated on the other, 3·3 inches long, 1·1 inch in greatest breadth, and ·4 inch where thickest, was found 1st February, 1872, in the first Foot-level of Cave-earth with a portion of a grey Flint nodule, apparently fractured artificially.

The second Implement (No. 5829), a bluish-grey Flint, semi-lunar in outline, 2·5 inches long, 1·5 inch broad, and fully ·5 inch in greatest thickness, was found 10th February, 1872, with a tooth of Hyæna and a tooth of Horse, in the third Foot-level of Cave-earth.

Up to the end of July, 120 teeth and a considerable number of bones, belonging to various kinds of mammals, had been met with. As the exploration of the Arcade is not completed, it is perhaps undesirable at present to exhibit the distribution of the teeth in a tabular form. The Hyæna, as usual, takes the lead, and is followed by the Horse and the Rhinoceros in their usual places.

Though, amongst the animal remains, several good specimens have been met with in the portion of the Cavern at present under notice, only two of them require special mention. One of these (No. 5968) was the right lower jaw of a young Bear, and, what is very unusual in the Cavern, perfect in all its parts. Such, however, was its fragility that it was broken in taking it out of the deposit. It was found July 30, 1872, with an additional canine of a young Bear, in all probability belonging to the same individual, and a tooth of Elephant, in the third Foot-level of Cave-earth, over which the Granular Stalagmitic Floor was 5 feet thick.

The other specimen (No. 5962) was a well-marked incisor of *Machairodus latidens*, found July 29, 1872, with the left lower jaw of Bear containing one molar, in the first or uppermost Foot-level of Cave-earth, having over it the Granular Stalagmitic Floor 2·5 feet thick. It answered admirably to the following description given by Mac Enery of the incisor he found:—"The internal face of the enamel is fringed with a serrated border. This tooth is distinguished further by two tubercles or protuberances at the base of the enamel from which the serration springs, and describes a pointed arch on the internal surface. . . . The body of the tooth in this specimen is not compressed but rounded." (*Ibid.* 370.) He adds, "Whether this belongs to an inferior species of *U. cultridens*, or [is] simply the incisor anterior to the canine of the larger species of *U. cultridens*, I am not able to pronounce with certainty. If merely the incisor, it is still interesting, as it serves to show that the serrated character is not confined to the canines, and that the rest of the teeth, and consequently the frame, are marked by a peculiar conformation."

A glance at the new specimen sufficed to explain why Mr. Mac Enery was uncertain respecting the canine or incisive character. Indeed the workmen sent it to the Secretary of the Committee under the belief that it was the canine of a Wolf; being partially covered with Cave-earth, its true character was detected whilst it was being washed, August 5, 1872.

Mr. Mac Enery stated that the incisor he found, which unfortunately cannot be traced, was "about an inch long"—the expression, in all probability, of a rough guess, and not of actual measurement. The incisor from the Cavern (doubtless that discovered and described by Mr. Mac Enery) figured by Professor Owen in his *History of British Fossil Mammals, &c.* (p. 182, fig. 70), very nearly corresponded in size with its

homologue just found. The new specimen was slightly longer in the crown, and somewhat thicker in the fang. [Since this Report was drawn, the incisor mentioned by Mr. Mac Enery has been found in the Exeter Albert Memorial Museum. (See *Trans. Devon. Assoc.* vii. 247-260.)]

The Committee cannot but feel that their thanks, as well as those of all palæontologists, are due to the Committee of the Geological Section for having, year after year from 1864 inclusive, cordially applied for a grant from the funds of the Association for the exploration of the Cavern; to the Committee of Recommendations for having recommended the successive applications; and to the General Committee for having annually voted the sums applied for. One of the hopes of the Cavern Committee, in commencing their researches, was that they might find some traces of *Machairodus*. This they have never abandoned, though year after year passed away without success; and they cannot but express their gratitude to the body whose patience and liberality has enabled them to continue their labours until this hope was realized. The greater part of this Report was written before the discovery was made; and had the work ceased on July 28, 1872,—the day immediately preceding the discovery—those who always declined to believe that *Machairodus* had ever been found in Kent's Cavern, would have been enabled to urge, as an additional argument, the fact that the consecutive, systematic, and careful daily labour of 7 years and 4 months had failed to show that their scepticism was unreasonable. This great accumulation of negative evidence has been for ever set aside, and all doubt of Mr. Mac Enery's accuracy on the point for ever removed, by the discovery the Committee have now had the pleasure to announce.

They can now announce also that *Machairodus latidens* and Man were contemporaries in Britain; for even if, notwithstanding the great array of facts to the contrary, the former should prove to have belonged to the era of the Breccia, and not to that later time represented by the Cave-earth, the two Flint Implements found in the Breccia, to which attention was called in a previous part of this Report, as well as that produced and described in the Fifth Report, in 1869, take Man back to that earlier period also. (See pp. 263-5, 329 above.)

NINTH REPORT. Read at Bradford, September, 1873. (See *Rep. Brit. Assoc.* 1873, p. 198-209.)

The Committee, in opening this their Ninth Report, have to state that while the work is still conducted, under the

Superintendents, by the same foreman (George Smerdon), the second workman (John Farr), believing that the Cavern work was prejudicial to his health, has obtained other employment. Though reluctant to part with so satisfactory a workman, who had faithfully served them for upwards of five years, the Superintendents felt unable under the circumstances to press him to remain, and they had the satisfaction of engaging in his stead a man (John Clinnick) who has proved most efficient and trustworthy.

A. R. Hunt, Esq., M.A., F.G.S., being about to assist in exploring Borness Cave on the coast of Kirkcudbright, visited Kent's Cavern in August, 1873, for the purpose of studying the mode of working.

The Long Arcade, continued.—The Committee stated in their Eighth Report, bringing the work up to the end of July, 1872, that they were then exploring the portion of the Cavern termed by Mr. Mac Enery The Long Arcade, and sometimes "The Corridor" (*Trans. Devon. Assoc.* iii. 235), and that they had expended about ten weeks' work on it. (See p. 330 above.) The exploration of this great thoroughfare has been the work of the entire period since that date, and it is still in progress.

The Arcade commences in the south-west corner of the Sloping Chamber, and, after a length of about 225 feet, in a west-south-westerly direction, and almost in a straight line, terminates in the "Cave of Inscriptions," or "Cul-de-sac." Its height varies from 10 to upwards of 20 feet, the measurements being taken from the bottom of the excavation made by the Committee. The roof and walls are much fretted and honeycombed, except at one part not far within the Entrance, where the fall of a very large block of Limestone apparently in comparatively recent times left edges tolerably angular and sharp.

Omitting blocks of Limestone here and there, the surface of the deposit in the Arcade when the Committee commenced its exploration presented but few inequalities; and when they had completed their excavation to the uniform depth of 4 feet below the bottom of the Granular Stalagmitic Floor, and up to the distance of 134 feet from the Entrance of the Arcade, the bottom of their section was no more than 40 inches above that at the commencement—a mean rise of no more than 1 in 40. At the point just specified, however, the passage was almost entirely closed with a vast mass of

Limestone *in situ*, covered in places with thick accumulations of stalagmitic matter, and rising to the roof apparently from the Limestone bottom of the Arcade. The only opening in it was an aperture adjacent to the right or northerly wall, and to gain this it was necessary to climb to the height of 8 or 9 feet. This opening was about 6 feet high, had a floor of Limestone with occasional stalagmitic incrustations, extended for a length of fully 20 feet, while very near its entrance, on the left or southerly side, was the elliptical mouth of a smoothly eroded tunnel, measuring 30 inches in horizontal and 27 in vertical diameter, and having the aspect of a watercourse. Beyond the mouth of this tunnel, and on the left side, lay in wild confusion several very large masses of Limestone, which had fallen from the roof obviously in remote times; and beyond these the deposit of Cave-earth again presented itself, but at a higher level than before.

Assuming the tunnel just mentioned to have been a watercourse, the stream issuing from it must have had a sudden fall of several feet; and it may not, perhaps, be without interest to state that on excavating the deposits in the Arcade, deep pot-holes were found in the right wall of the Cavern, having the position and character such a fall would have produced. The tunnel, fully 60 feet long, terminates in a branch of the Cavern known as The Labyrinth, and in one part of its course is so contracted as to render it somewhat difficult for even a small man to force his way through it. It has long been known as "The Little Oven;" and when the Cavern was visited by sight-seers merely, it was regarded as an achievement to have made its passage.

One of the results of the work during the last twelve months has been to show that the great mass of Limestone, which, as already stated, almost completely closed the Arcade, extended downwards, not to a Limestone floor, but merely to the level of earthy deposits which choked up a passage beneath. The loose and confusedly grouped blocks of Limestone already spoken of have been blasted and taken out of the Cavern; the blocked-up passage has been reopened, and is now the common thoroughfare; the mass of rock overhead has been dignified with the name of "The Bridge;" and the excavation has been completed far beyond it.

The Arcade is very narrow in proportion to its length. From 17 feet wide at the Entrance, it narrows to 5 feet at about 27 yards within; then expands to 11 or 12 feet, and again contracts, until at 42 yards, it is no more than 6 feet

wide ; it enlarges once more to an average width of 9 feet, and beyond the Bridge it becomes an irregular chamber, upwards of 30 feet long and about 15 wide. The exploration has been completed to the inner end of this chamber.

In the left or southerly wall of the chamber just mentioned is the entrance to the Labyrinth, and of an adjacent smaller branch. Towards these the workmen are now directing their labours.

As the earlier explorers had made some excavations here and there throughout the greater part of the Arcade, and thus deprived the Committee of the opportunity of studying it before disturbed by Man, the following description, compiled from Mr. Mac Enery's manuscripts, may be of interest :—The floor was in great disorder, strewn with rocks having between them in certain places natural reservoirs of water, and in others loose heaps of red marl overspreading the Stalagmite and containing fossil bones. The first Rhinoceros tooth found in the Cavern was met with in one of those heaps. A peculiarity of this passage was a profusion of a white crumbling substance not unlike half-slacked lime. Rock after Rock, on being turned over, presented patches of it on its surface ; the loose mud also contained it ; and wherever Stalagmite had formed between the rocks, it, when ripped up, exhibited large deposits of the same matter. In the crevices of the rock and near the surface of the Cave-earth it occurred in balls partly crushed ; several balls were found in some instances pressed together, in others uninjured, adhering, and exhibiting the tapering point they had when dropped by the animal ; and they were occasionally found singly. There was no doubt that they were coprolites ; and there was no difference between these fæcal deposits and those of the Hyæna in Exeter Change, except in the far greater size of the fossil balls. The osseous substance was the same in both ; undigested particles of bone and enamel were detected in some of them ; and the explorers were led to the conclusion that the Arcade was the chosen resort of the Cavern Hyænas for purposes of cleanliness. In this they were subsequently confirmed by a letter from Captain Sykes to Dr. Buckland, published in the *Edin. Phil. Journal* (xvi. 378–9), descriptive of a recent Hyæna Cave in India, where, from the almost exclusive accumulation of fæces in particular spots, the writer inferred that certain chambers were dedicated to cleanliness. In these retreats few or no bones occurred. "This description," says Mr. Mac Enery, "is in its details quite applicable

to Kent's Hole. It appears to have been preserved to us in its actual state as when occupied by the extinct Hyæna. . . . Whilst reading his letter, I imagined myself reading the history of another, sealed one—the duplicate of Kent's Cave, and not the account of a living Hyæna's den." Wherever this substance was found accompanying remains, the latter were invariably broken, and always in the same uniform manner; and none of it was found where they occurred entire. Dr. Buckland, to whom the material was pointed out, gave the Arcade the name of the "Hyæna Cloaca Maxima." About half-way in the length of the Arcade, and near the left or southerly wall, three circular hollows were observed in the Floor, about 3 feet in diameter, lined down the sides with a thin waving crust. The greasiness of the earth, and the presence of single teeth of Bear in different states of preservation, at first suggested the idea that they were the beds of that animal, whose habit it is to crouch in particular spots; but the occurrence of charcoal, and other indications of the presence of Man, in the vicinity of the hollows were thought rather to lead to the opinion that they were rude hearths or ovens scooped out by savages, around which they collected to cook and enjoy the spoils of the chase. (*Trans. Devon. Assoc.* iii. 235-7, 253-4, 270, 290, 302-5.)

Before returning from this digression, it may be well to offer a few remarks on certain points in the foregoing description, on which the exploration now in progress is calculated to throw some light:—

1st. "The loose heaps of red marl" in all probability consisted of material deposited in the era of the Cave-earth, and over which no Stalagmite had in those particular spots ever been formed. If, however, they were actually observed, and not merely inferred, to "overspread the Stalagmite," the latter, there can be little doubt, was the Crystalline Stalagmitic Floor, older than the Cave-earth, of which the Committee have found numerous portions in the Arcade during the present year, as well as in other branches of the Cavern in previous years, some of them *in situ* and others not.

2nd. The Committee have also found a considerable quantity of coprolitic matter in the Arcade, never, however, more than 12, and rarely more than 6, inches below the surface. This material has been met with in all parts of the Cavern wherever the Cave-earth has presented itself, but in no instance in any older or more modern deposit, whether of mechanical or chemical origin. The Lecture Hall may

perhaps be equally entitled to the name of the *Hyæna Cloaca Maxima*. (See p. 234 above.)

3rd. There seems no reason to doubt that the "three circular hollows," instead of being the "beds of bears," or "hearths or ovens scooped out by savages," were natural basins in the Stalagmite, such as were described in the Committee's Eighth Report (see p. 331 above); for, to say nothing of the fact that several such basins, even when not more than a very few inches in diameter, have contained charred wood, possibly washed into them in rainy seasons when such basins are full to overflowing, or perhaps dropped into them accidentally by recent visitors, it is difficult to understand why a savage should have selected for his hearth a spot having nothing to recommend it but its darkness and inconvenience, whilst so many others, in every respect more eligible, were equally at his command. It is noteworthy that, in another part of his Memoir, Mr. Mac Enery, replying to Dr. Buckland's suggestion that "the Ancient Britons had scooped out ovens in the Stalagmite," says, "Without stopping to dwell on the difficulty of ripping up a solid Floor, which, notwithstanding the advantage of undermining and the exposure of its edges, still defies all our efforts, though commanding the apparatus of the quarry, I am bold to say that in no instance have I discovered evidence of breaches or ovens in the Floor." (*Trans. Devon. Assoc.* iii. 334.) But waiving all this, the Committee, on March 31, 1873, in the course of their work reached a hollow precisely similar to those Mr. Mac Enery described. It was of oval form, 4 feet long, 2 broad, 9 inches deep, and contained nearly 10 gallons of beautifully pure water; but, instead of having been formed by a Bear or a Human being, it was an example of Nature's handiwork, and in such a position as to render it certain that the foreman of the exploration now in progress was the first person who ever saw it. It was in the Granular Stalagmite covering the deposit, which, as already stated, completely filled up the space beneath the Bridge, and was neither discovered nor discoverable until the workmen had advanced 11 feet horizontally in the difficult work of reopening this passage.

At the Entrance of the Arcade, the Granular Stalagmitic Floor was continuous in every direction for considerable distances. At the right or northerly wall its thickness, exclusively Stalagmite, exceeded that hitherto found in any other part of the Cavern, measuring fully 5 feet for a length of about 8

yards; but at the opposite wall it was very rarely more than 2 feet thick. Beyond the point just specified it became gradually thinner, disappearing entirely at 37 feet from it on the right wall, but extending somewhat farther on the left. Still farther in, such Floor as ever existed appears to have been but thin and occasional only until reaching the Bridge, where it appeared again in considerable volume. It is worthy of remark that at the Entrance of the Arcade, where the Stalagmitic Floor is so very thick, the drip of water from the roof is at present very copious in rainy seasons, and commences within a few hours of a great rainfall; while those parts of the same branch of the Cavern where there does not seem to have ever been any Stalagmite are perfectly dry at all times and seasons. Almost immediately beyond the Bridge, there rose from the Stalagmitic Floor a large boss of the same material, in the form of a paraboloid, 2 feet high and 6 feet in basal circumference. As it bore no inscription, and was in the direct line of the work, it was dislodged and broken up, when it was found to consist of pure Stalagmite without any extraneous substance. In the earthy deposit adhering to its base were one tooth of Bear, a fragment of bone, a coprolite, and a few bits of charcoal. Not far beyond it, but near the right wall of the Arcade, a much larger boss presented itself, having near its summit the inscription "R. L." (or E.) "1604." The mass has been so mutilated by early visitors as to render it uncertain whether the second letter was L or E. The date, however, which is quite distinct, and appears not to have been noticed before June 6th, 1873, is the oldest at present known in the Cavern, though there are several others of the seventeenth century. In excavating, care was taken to leave the mass, as well as the deposit on which it was formed, intact and undisturbed. [A still earlier inscription was subsequently discovered. See the Thirteenth Report, below.]

The only objects found in the Granular Stalagmitic Floor, in the Arcade, since the Eighth Report was presented, were a tooth of Hyæna, a few bones and bone chips, a "charcoal streak" about 3 inches above the base of the Floor, whose total thickness was 42 inches at one end and 10 at the other, a few pieces of charcoal, and a Flint tool. The Tool (No. 5990) is of very white Flint, having, as shown by an accidental fracture, a very chalk-like texture. It may be described as a hammer-like Core, broad at one end, round-pointed at the other, and formed by several flakes having been struck from the original nodule. Its pointed end shows that it has been

used as a hammer. It is 3·2 inches long, 2 inches in greatest breadth, 1·7 inch in greatest thickness, and was found August 19th, 1872.

As already stated, remnants of the Crystalline Stalagmitic Floor occurred *in situ* in various parts of the Arcade, all attached to the right or northerly wall, and above the level of the Granular Floor. The first of them, about 60 feet within the entrance of the Arcade and 6 inches thick, had between it and the Granular Floor an unoccupied space 15 inches high. The second, 20 feet farther up the Arcade, was a very large mass displaying strikingly the characteristic prismatic Crystalline structure. It has suffered much at the hands of visitors, and on one of its fractured surfaces is the date 1836. The third and most important, about 30 feet long, lined the entire lower surface of the mass of Limestone forming the Bridge, and extended into the chamber beyond. The less ancient, or Granular Floor, was in some places in contact with it, and in others as much as 8 inches below. Numerous stones and a few fragments of bone, representing the Breccia on which the Crystalline Floor was formed, were found firmly cemented to this, as well as to the first remnant. The progress of the work has not rendered it necessary to remove or diminish either of them.

The deposit below the Granular Stalagmitic Floor was typical Cave-earth to the depth of at least 4 feet, from the entrance of the Long Arcade to about 24 feet within it, and contained a considerable number of blocks of Limestone, several of which required blasting in order to be removed. Beyond the point just specified the deposit was everywhere Breccia, except, at most, the uppermost foot, consisting of Cave-earth. The two deposits lay one on the other without any Stalagmite between them; and though they are so very dissimilar in composition, it was not always easy to detect a well-defined line of separation. Each, however, was, as elsewhere in the Cavern, characterized by its distinct fauna—the Breccia containing remains of Bears only, while the Cave-earth yielded bones and teeth of Hyænas, with their teeth-marks and coprolites, as well as the remnants of the animals usually associated with them.

At the entrance of the Arcade, Mr. Mac Enery's diggings had been carried to a depth of 3 feet below the bottom of the Granular Stalagmite; they gradually became less and less deep until, at a distance of 15 feet, they ceased. They were resumed at 52 feet, and continued at intervals so far as the

Committee have at present explored. They were, however, on a very limited scale, never exceeding 18 inches, and commonly not more than a foot in depth, and did not always extend from wall to wall. In short, he seems to have contented himself with occasionally digging a small shallow trial pit, and, meeting with no specimens, to have proceeded elsewhere; and this is borne out by his own statement. "As we advanced in the direction of the Long Corridor" [=Long Arcade], he says, "the bones became less and less numerous until they nearly disappeared, rendering it not worth our while to prosecute our researches further in that line." (*Trans. Devon. Assoc.* iii. 290.) He must, however, in some instances have broken up portions of the Breccia as well as of the thin layer of Cave-earth lying on it; for, as was his wont, he merely cast aside the materials he dislodged, and did not take them out of the Cavern; and these, on being carefully examined by the Committee, were found to contain undoubted fragments of the Breccia, with bones and teeth of Bear firmly embedded in them.

The specimens recovered from this excavated material, and which had been neglected or overlooked, belonged mainly to the Cave-earth. They were 72 teeth, 4 astragali, 5 calcaneums, 15 phalanges, 1 claw, 3 portions of jaws, 2 vertebrae, 1 portion of skull and 1 of antler, several fragments of bone, and 8 Flint flakes and chips. With them was a portion of an iron hammer, which, on becoming useless, Mac Enery or his workmen had, no doubt, thrown away.

Omitting those of Bear, at least some of which belonged to the era of the Breccia as already stated, the teeth may be distributed as in the following Table:—

TABLE XVI.—Showing how many per cent. of the Teeth found in the disturbed material in the Long Arcade belonged to the different kinds of Cave Mammals.

Hyæna . . .	70 per cent.	Ox . . .	3 per cent.
Horse . . .	10 "	Elephant . .	1·5 "
Rhinoceros. .	10 "	Fox. . .	1·5 "
Deer. . .	3 "		

The Flint flakes mentioned above were of little value when compared with many others found in the Cave-earth.

Up to the end of August, 1873, the Cave-earth which the Committee found intact in the Long Arcade had yielded, when the few mentioned in the Eighth Report are included,

about 280 teeth, which may be apportioned as in the following Table :—

TABLE XVII.—Showing how many per cent. of the Teeth found in the Cave-earth in the Long Arcade belonged to the different kinds of Cave Mammals.

Hyæna . . . 40 per cent.	Deer . . . 2.5 per cent.
Horse . . . 24 „	Megaceros . . 1.5 „
Rhinoceros . . 11 „	Elephant . . 1.5 „
Bear . . . 9 „	Dog? . . . 1.5 „
Fox . . . 5 „	Lion . . . 1.0 „
Pig . . . 3 „	Machairodus . only 1 incisor.

On comparing the foregoing Tables with those in previous Reports, the following facts present themselves:—

1st. That the Hyæna was everywhere the most prevalent animal of the Cave-earth era, and was followed by the Horse and Rhinoceros.

2nd. That the Bear was relatively more prevalent in the Long Arcade than in any other part of the Cavern explored by the Committee.

3rd. That teeth of Wolf, Badger, Rabbit, Reindeer, and Sheep, the last probably recently introduced by Foxes and other burrowing animals frequenting the Cavern—all of which presented themselves in the various portions of the Eastern Division of the Cavern—had not been met with in the Long Arcade.

None of the animal remains found in the Cave-earth during the last twelve months require detailed description or special remark. Many of the bones had been gnawed by the Hyæna; some were much decayed; a few small fragments had been burnt; and one, a phalanx, exhibited marks of disease. The few remains of the Elephant were those of immature animals; one canine of Lion (No. 6020) was worn almost to the fang; and a right lower jaw of Pig (No. 6098), found March 26, 1873, without any other specimen near it, contained eight teeth, some of which had not risen quite above the jaw. It had a very fresh aspect.

Including the two (Nos. 5819 and 5829) mentioned in the Eighth Report, the Cave-earth in the Long Arcade had up to the end of August, 1873, yielded 25 Flint Implements and flakes, without counting those found in Mr. MacEnery's excavated material. Though many of them would have attracted a large share of attention a few years ago, a description of a very few will suffice at present :—

No. 6082, a light-grey Flint having a sharp edge all round its perimeter, was nearly flat on one side, and slightly convex on the other, from which four principal longitudinal flakes had been dislodged. It belonged to the lanceolate variety of Implements, was about 3.5 inches long, 1.2 inch in greatest breadth, .25 inch in thickness, and was found February 22nd, 1873, without any animal remains near it; and no Stalagmite had ever covered the deposit in which it lay.

No. 6086 may be said to belong to the same type, but was more massive, and abruptly truncated at each end. It was 3.5 inches long, 1.6 inch in greatest breadth, .6 inch thick, very concave on the inner face on which a "bulb of percussion" was well displayed near what may be termed the point; and the outer very convex face had been rudely fashioned. It did not appear to have been used; its edges were quite sharp and not serrated or chipped. It was found March 4, 1873, with a tooth and a gnawed scapula.

Up to the end of August, 1873, there had been found in the Breccia in the Long Arcade upwards of fifty teeth, together with a considerable number of bones, of Bear. As they were much more brittle than those found in the Cave-earth—probably from their highly mineralized condition—and almost invariably occurred where the materials of the deposit were firmly cemented together, it was often impossible to prevent their being injured in the process of extraction. Not unfrequently bones or teeth were found in the concrete broken, but having the parts in contact and juxtaposition, showing that they had been broken where they lay and where they were found. Beyond a few teeth still occupying portions of jaws, the remains did not lie in their natural anatomical order; and isolated teeth frequently presented themselves completely encased with Breccia. In no instance was there any thing like an approach to the elements of a complete skeleton, or distinct portion of one, lying together.

The only noteworthy specimens were a left lower jaw (No. 6127), containing two teeth, found June 18, 1873, and a palate (No. 6133), with the greater part of the upper jaw, in which were four molars and the two canines. This fine specimen was found June 25, 1873, and with it two other canines and a few fragments of bone.

It is perhaps worthy of remark that as no trace of *Machairodus* has been found in either of the deposits since the Eighth Report was presented, the Committee can only repeat that, so far as the evidence goes at present, that great Carni-

vore was a member of the Fauna of the Cave-earth era, but not of that of the Breccia.

In their Eighth Report the Committee stated that they had found two Flint Implements (Nos. 5900 and 5903) in the Breccia in the Southern Branch of the Charcoal Cave; and they pointed out the important bearing of the fact on the question of Human Antiquity. (See p. 329 above.) They have the pleasure of reporting the discovery, during the last twelve months in the Long Arcade, of seventeen additional Implements, flakes, and chips in the Breccia, of which the following were the most striking specimens.

No. 6022, a fine kite-shaped Flint Tool, 5·1 inches long, 2·6 inches in greatest breadth, and 2 inches in greatest thickness. On one side, especially at the but-end, it was very convex; the other had a tendency to flatness, but as this inner face consisted of two principal planes or facets sloping in opposite directions from a transverse ridge about midway in its length, the flatness was not strongly pronounced. At the but-end, on the convex face, much of the original surface of the nodule was retained, and showed that it was made from a well-rolled pebble. The rest of the surface had a somewhat orange-coloured ferruginous tint, derived, no doubt, from the matrix in which it was found. On one or two small facets near the point, however, this tint did not appear, but the true whitish colour was displayed. A small chip had been unfortunately struck from it by the tool of the workman and thus disclosed the interior, which was of the same colour as the facets just named, but differed from them in being somewhat granular, whilst they were quite smooth. Within the substance of the implement and near the point there was a small irregular quartz pebble. This specimen was found on November 27th, 1872, at a depth of 16 inches in the undisturbed Breccia, under a block of Limestone measuring $24 \times 14 \times 14$ inches, adjacent to the left wall of the Arcade, and 73 feet from its Entrance. No animal remains or other objects of interest were found near it. (See *Trans. Plymo. Inst.* v. 358, fig. 10.)

No. 6025, a fine Implement, rudely foot-shaped, 5·4 inches long, 2·5 inches in greatest breadth, 1·7 inch in greatest thickness, had undergone a considerable amount of chipping, was very convex on one face, had a tendency to flatness on the other, and no portion of the original surface of the nodule remained on it. It was of a yellowish drab colour, and had a patina on the greater part of its surface. It was found December 9th, 1872, not quite a foot deep in the

Breccia, very near the left wall of the Arcade, about 86 feet from its Entrance, and without any animal remains accompanying it.

No. 6081, an orange-coloured Flint Implement, rudely elliptical in outline, very massive, about 6 inches long, 3·7 inches in greatest breadth, 2 inches in greatest thickness, very convex on one face, with a tendency to flatness on the other, had a great number of facets on each face, but with portions of the original crust of the nodule here and there. On the flatter face there was a rugged elliptical hole, nearly central, ·9 inch long, ·65 inch broad, and ·7 inch deep; but, instead of being artificial, was structural, as the original crust of the flint extended into it from a neighbouring patch on the face of the tool. This specimen was found in the third Foot-level of the Breccia, without any organic remains near it, February 14th, 1873, at about 122 feet from the Entrance of the Arcade.

No. 6103, a coarse Chert tool about 4 inches long, 2·3 inches in greatest breadth, 1·6 inch in greatest thickness, very convex on both faces, and worked to an edge all round. A large amount of labour had been bestowed in fashioning it, and no part of the original surface of the nodule remained. It was found, without any animal remains near it, May 7th, 1873, in the fourth Foot-level of the Breccia, a small portion of which adhered to it.

No. 6110, apparently of the same variety of Chert, was rudely semilunar in form, 2·9 inches long, 1·8 inch in greatest breadth, 1·2 inch in greatest thickness, had a thin edge on its rectilinear margin, but attained its greatest thickness at the other, and had probably been used as a Scraper. It was found May 28th, 1873, at about 166 feet from the Entrance of the Arcade, without any organic remains near it, in the second Foot-level of the Breccia, traces of which still remained on it.

No. 6128, at once a rude parallelogram and an oval, 2·9 inches long, 1·9 inch in greatest breadth, ·8 inch in greatest thickness, slightly and irregularly concave on one face, and convex on the other. Its greatest thickness was very near one margin, whence it sloped to a comparatively thin edge on the other. Its internal structure was somewhat chalk-like; and it had, perhaps, been slightly rolled. It was found about 172 feet from the Entrance of the Arcade in the first Foot-level of the Breccia, without any noteworthy objects near it, on June 18th, 1873.

No. 6129, a fine Implement of the same form as No. 6022,

was 5·5 inches long, 2·8 inches in greatest breadth, 1·6 inch in greatest thickness, approximately flat on one face, and very protuberant on the other, which retained a portion of the original surface of the nodule. It was of a somewhat coarse cherty structure and a dull pinkish colour. It was found on June 20th, 1873, in the fourth Foot-level of the Breccia, almost immediately under No. 6128, but 3 feet deeper in the deposit, and without any bones or teeth near it.

No. 6139, a faint pink, unshapen lump of Flint, the surface of which had nevertheless been artificially produced. It was, perhaps, a Core, or an Implement spoiled in the attempt to make it. It was found about 128 feet from the Entrance of the Arcade, without any objects of interest near it, in the third Foot-level of the Breccia, July 2nd, 1873.

No. 6174, like Nos. 6110 and 6128, was thickest at one margin, and sloped thence to an edge at the other, and, like them, had probably been used as a Scraper. It was 2·6 inches long, 1·6 inch in greatest breadth, and 1·1 inch in greatest thickness, and was found, with a tooth of Bear and a few bones, on August 19th, 1873, in the second Foot-level of the Breccia, at about 128 feet from the Entrance of the Arcade.

The facts disclosed since the Committee presented their Eighth Report, and which have been described above, point to certain conclusions, and suggest a few speculations, to which it may not be out of place to call attention.

The remnants of Crystalline Stalagmitic Floor in the Long Arcade, with stones still cemented to their under surfaces, like those in the Gallery opening out of the Great Chamber, and in the Branches of the Charcoal Cave (see pp. 206-8, 325 above), are capable of but one explanation. They point to a time when the Breccia was introduced, and they mark or define the height it reached; they show a subsequent period when this accumulation was sealed up with a Stalagmitic sheet of which they are the remains; and they make known the facts that a portion of the Breccia was dislodged, and vast masses of the Floor which covered it were broken up. This was followed by the introduction of the Cave-earth; and that by the formation of another Floor of Stalagmite, differing from the former in being Granular instead of Crystalline.

That the Breccia was derived from without the Cavern is certain from the fact that the Cavern-hill contains no rock capable of furnishing the materials composing it. Such

materials, however, are derivable from loftier adjacent eminences.

That the conditions of the surface of the district adjacent to the Cavern must have changed between the period of the Breccia and that of the Cave-earth, is manifest from the fact that such materials as formed the staple of the earlier deposit did not find access during the later.

The scantiness of the Cave-earth in the Arcade, and its immense volume in the Eastern Division of the Cavern, especially in the portions of it into which the External Entrances open, as well as those immediately adjacent, indicates that this deposit was derived very largely, if not entirely, from external sources, and not from the wasting of the walls and roof of the Cavern, since there is no reason to suppose that the rate of disintegration or decomposition would differ so very greatly in the different Chambers and Galleries. It may be worthy of remark, moreover, that, all other things being the same, the thickness or depth of a deposit derived from the waste of the walls and roof of a chamber must be greatest in the narrowest chamber, whilst the reverse obtains in the present case.

A glance at the Implements from the two deposits shows that they are very dissimilar. Those from the Breccia are much more rudely formed, more massive, have less symmetry of outline, and were made by operating, not on *flakes* purposely struck off from nodules of Flint or Chert, as in the case of those from the Cave-earth, but directly on the *nodules* themselves, all of which appear to have been obtained from accumulations of Supracretaceous gravel, such as occur about four miles north-westerly from the Cavern. There seems no doubt, then, that the Breccia Men were ruder than those of the Cave-earth; and this is borne out by the fact that whilst the men represented by the less ancient deposit made Bone tools and ornaments—Harpoons for spearing fish, eyed-Needles or Bodkins probably for joining skins together, Awls perhaps to facilitate the passage of the slender needle or bodkin through the tough thick hides, Pins for fastening the skins they wore, and perforated teeth for necklaces or armlets—nothing of the kind has been found in the Breccia. In short, the Stone tools, though both sets were unpolished and coeval with extinct mammals, represent two distinct civilizations.

It is equally clear that the ruder men were the more ancient; for their Tools were lodged in a deposit which, whenever the two occurred in the same vertical section, was inva-

riably the undermost. In fact the Breccia in which each of the Implements was found had Cave-earth actually lying on it.

That the chronological interval separating the two Deposits, Tools, Men, and Eras, was a great one is indicated by the several facts which have been enumerated. The altered condition of the surface of the adjacent district manifested by the dissimilar mineral and physical characters of the deposits, the sheet of Crystalline Stalagmite which usually separated them and in one instance attained a thickness little, if at all, short of 12 feet, the destruction of great masses of this Sheet, the dislodgment of a considerable portion of the Breccia on which it was formed, and the distinctness of the two Cavern-faunæ are phenomena very significant of an amount of time incapable of compression within narrow limits.

When the cavern-haunting habits of the Hyæna are remembered, it can scarcely be unsafe to conclude from the absence of any trace of him in the Breccia that he was not an inhabitant of Britain during the era of that deposit. The same argument can by no means be applied with equal force to the Horse, Ox, Deer, &c., whose absence is equally pronounced, for it may be presumed that their bones occur in caverns at least mainly because their dead bodies were dragged there piecemeal by the Hyæna; and this could not have occurred before his arrival. The Ursine remains met with in the Breccia present no difficulty, as the Bear, like the Hyæna, is a cave-dweller.

Dr. A. Leith Adams, M.A., F.R.S., F.G.S., so well known as a naturalist and cavern-explorer, has been so good as to favour me with the following note on the habits of the Brown Bear of the Himalayas:—"The Brown Bear of the Western Himalayas hibernates, choosing chiefly caverns and rock-crevices, which it abandons in spring to wander about; but old individuals, when no longer equal to the same amount of exertion, take to a secluded life, and usually select a cavern on a rocky mountain-side, at the base of which there is abundant verdure and shade, with a pool or spring, where they bathe frequently or recline during the heat of the day to escape annoyance from insects. Such retreats are easily discovered by the animal's footprints on the soil and turf. They are seen like steps of stairs leading from the pool in the direction of the den, being brought about by the individual always treading in the same track. Thus these patriarchs or hermit bears spend their latter years in one situation, pursuing the even tenor of their ways to the little stream or pond below, and grassy slopes to feed on the rank vegetation,

returning regularly to the caverns where they end their days." (See *Wanderings of a Naturalist in India, Western Himalayas, and Cashmere*, pp. 232-241, &c.)

The fact that though the Hyæna was not a member of the British Fauna during the era of the Breccia, he had become very prevalent during that of the Cave-earth, may probably be taken as indicating that after the period of the Breccia, Britain was a part of continental Europe, and thus rendered his arrival possible. If this be admitted, it follows that the early men of Devonshire saw this country pass from an insular to a continental state, and again become an island.

[The announcement in the *Geological Magazine* for October, 1883 (pp. 433-5), of the recent discovery on the coast of Suffolk of remains of the Cave Hyæna in beds as old, at least, as the Cavern Breccia, renders it necessary to reconsider the bearing of the Kent's Cavern facts on the question of Pre-glacial Man in Devonshire.]

The Superintendents of the work, struck with the great development of the Breccia in the innermost parts of the Cavern, as well as with the numerous remains of Bear which it contains, are strongly inclined to the opinion that there must be an External Entrance hitherto unsuspected, and at present choked up, in the direction in which the work is now progressing. It must be admitted that this would solve several problems of interest; but the complete exploration of the Cavern can alone show whether or not such an Entrance exists.

TENTH REPORT. Read at Belfast, August, 1874. (See *Rep. Brit. Assoc.* 1874, pp. 1-17.) Before entering on this, their Tenth Report, the Committee desire to express their deep sense of the great loss they have sustained in the decease of Professor Phillips. No member was more regular in his attendance at the meetings of the Committee, or felt a livelier interest in the investigation with which they are charged. On March 18th, 1874 (little more than a month before his lamented death), though suffering from a severe cold, he visited the Cavern, when he carefully inspected those parts of it which had been explored, and expressed his admiration of the clearness and importance of the evidence bearing on the question of Human Antiquity which had been obtained.

During May, 1874, an arrangement was made with the Superintendents by Professor Alfred Newton, F.R.S., of Mag-

dales College, Cambridge, for Mr. H. H. Slater, one of the Naturalists to the Rodriguez Transit Expedition, to spend some time in the Cavern studying the mode of exploration followed there, it being not improbable that he might have to explore some very interesting caves existing in the island of Rodriguez, and where, instead of intelligent men, he would probably have only half savages to dig for him. Mr. Slater reached Torquay on June 1st, when everything was done to facilitate his purpose, and he spent some days watching the men at work.

The Long Arcade, continued.—On carefully perusing Mr. Mac Enery's "Cavern Researches," it was found that he regarded a large boss of Stalagmite, bearing numerous inscriptions, and which it is proposed to call "The Inscribed Boss of Stalagmite," as being in the Cave of Inscriptions, and not in the Long Arcade. To prevent ambiguity, it has been decided to adopt Mr. Mac Enery's boundary and to regard the Long Arcade as extending from the south-west corner of the Sloping Chamber to, but not beyond, the Inscribed Boss. Thus defined, it stretches for about 225 feet in a tolerably straight line towards south-south-west, varies in height from about 10 to 20 feet (the measurements being taken from the bottom of the excavations made by the Committee), and from 5 to nearly 20 feet in width.

Besides being the only available passage to the Cave of Inscriptions, which may be regarded as its expanded prolongation, it throws off two branches on the left or eastern side and one on the right. Of the former, the most northerly is known as "Underhay's Gallery," and the second, a few feet farther south, consists of two successive and considerable chambers, termed "The Labyrinth" and "The Bears' Den." The branch on the right side, it is proposed to name "Clinnick's Gallery." The three branches are very near the inner end of the Arcade.

So far as the Arcade is concerned, Mr. Mac Enery's researches entirely ceased about 12 feet before reaching its end, and throughout this remaining area the Granular Stalagmite was everywhere continuous, and varied from 12 to 30 inches in thickness. Its surface was occupied with large natural "Basins," some of them 12 inches deep, such as have been described in previous Reports. (See pp. 331, 339 above.) While the excavation was in progress several points of interest connected with the Basins were noted :—

1st. The Stalagmite forming their walls was harder and tougher than that surrounding them, whilst that composing their bottoms was comparatively soft and friable.

2nd. Their walls were traceable through the entire thickness of the Stalagmitic Floor; in other words, during the entire deposition of the Floor, Basins had existed in it, the bottom rising with the walls but at a slower rate.

3rd. The water which filled them in rainy seasons passed down through the bottom in 3 or 4 hours at most.

4th. Immediately beneath most of the Basins there was an almost continuous interspace of about half an inch vertically between the bottom of the Stalagmite and the top of the Cave-earth, caused, no doubt, by the finer particles of the deposit being carried by the percolating water through interstices to a lower level.

It happened that the exploration of that part of the Arcade in which the Basins were thus numerous was carried on during a very wet season, when the water passing through the Granular Stalagmitic Floor, as just mentioned, caused two or three slips in the Cave-earth and the Breccia. The largest of these fell during the night of January 8th-9th, and in the fallen matter a tooth of Bear, a vertebra, fragments of bone, and a well-rolled Flint nodule were found. It was, of course, impossible to say whether this nodule belonged to the era of the Cave-earth or that of the more ancient Breccia.

The Crystalline Stalagmite was also occasionally met with *in situ*, and always vertically beneath the Granular or less ancient variety. In some instances there was a space between them filled with the true Cave-earth with its characteristic bones and coprolites, while in others the two Stalagmites were in immediate contact, one lying on the other. Where the older variety did not exist the Cave-earth lay at once on the Breccia.

The only noteworthy objects found in the Granular Stalagmite were a tooth of Bear, fragments of bone, one considerable "find" of coprolites, and charred wood on two occasions. The following is the complete list of objects of interest found in the Granular Stalagmite throughout the entire length of the Long Arcade from July, 1872, to February 23rd, 1874, when its exploration closed:—2 teeth of Hyæna, 1 of Bear, 1 of Deer, a large vertebra, fragments of bone on several occasions, several specimens of charred wood, a Flint tool or Core (No. 5990), and a piece of black Flint.

Since the period at which the Ninth Report closed, the undisturbed Cave-earth in the Long Arcade has yielded a considerable number of bones and fragments of bone, and 63 teeth (= 30 of Hyæna + 24 of Bear + 4 of Horse + 3 of Mammoth + 2 of Fox).

The total number of Teeth found by the Committee in undisturbed Cave-earth in the Arcade, from first to last, was about 340, which may be distributed as shown in the following table:—

TABLE XVIII.—Showing how many per cent. of the total number of Teeth found by the Committee in undisturbed Cave-earth throughout the Long Arcade belonged to the different kinds of Mammals.

Hyæna	41·5 per cent.	Deer	2 per cent.
Horse	21 "	Mammoth . . .	2 "
Bear	14·5 "	Megaceros . . .	1 "
Rhinoceros . .	9 "	Dog (?)	1 "
Fox	4·5 "	Lion	1 "
Pig	2·5 "	Machairodus . .	1 tooth only.

It is perhaps worthy of remark that in the Long Arcade, as elsewhere so far as the exploration has extended, wherever Cave-earth presented itself there were also remains of the Hyæna found, and in greater numbers than those of any other kind of mammal. Nor were his teeth and bones the only indications of his presence in the Arcade; for, to say nothing of the fact that some of the remains found with his were gnawed, nearly 40 "finds" of his coprolites were met with. They sometimes, though rarely, consisted of a solitary ball, whilst at others upwards of 20 were lying together and not unfrequently cemented into considerable lumps. Occasionally the amount of matter of this kind found in a single day was sufficient to fill a very large basket.

The following specimens of Flint and Chert were found in the Long Arcade since the end of August, 1873:—

No. 6304 was merely a Flint chip so angular as to render it improbable that since its dislodgment from the nodule it had been in any way exposed to the action of flowing water. It was found in the first Foot-level of Cave-earth, with 2 teeth of Bear, bone chips (one of them being burnt), and 11 balls of coprolite, on December 13, 1873.

No. 6324, found December 30th, 1873, in the second Foot-level, beneath the Floor of Granular Stalagmite from 2 to 2·5 feet thick, was a very symmetrical tongue-shaped Tool,

fashioned with much labour out of a Chert nodule, and worked to an edge all round the perimeter except at the but-end, where portions of the original surface remained on both faces. It was 3·8 inches long, 2·3 inches in greatest breadth, 1·5 inch in greatest thickness, and convex on both faces, from each of which several flakes had been struck. Its era could not be determined with perfect accuracy, since it occurred at or near the junction of the Cave-earth and the Breccia, where they were not separated by Stalagmite. The fact that it was fashioned out of a nodule and not out of a flake, suggested that it belonged to the Breccia; and this found some support from its occurrence in the second Foot-level, for though the Cave-earth occasionally attained that depth in the inner part of the Arcade, it did so but rarely. On the other hand, its symmetrical outline and comparatively high finish were equally suggestive of the Cave-earth period.

The presence of man in the Cave-earth of the Arcade was also indicated by several bones apparently charred. Specimens of this kind were met with on six different occasions.

Without including those found in the materials dislodged by their predecessors the Committee met with a total of 27 Implements of Flint and Chert in the Cave-earth which they found intact in the Long Arcade.

From the end of August, 1873, to the end of July, 1874, a considerable number of bones and 149 teeth of Bear, but no known remnant or indication of any other kind of animal, were found in the Breccia in the Arcade, making a total of about 200 teeth of this genus met with in this oldest of the Cavern deposits, so far as is known at present, in the portion of the Cavern now under notice. Though several good specimens were obtained, none of them required special remark or description.

The Breccia yielded also 10 Tools, flakes, and chips of Flint and Chert during the twelve months just closed.

No. 6186, a Chert pebble, displaying some chipping, but not sufficient to convert it into a useful tool, was found in the third Foot-level of Breccia, without any other object of interest, September 2, 1873.

No. 6192, a rude flake of Flint, retaining a portion of the original surface of the nodule, and distinctly showing a "bulb of percussion," was found alone in the Breccia, in the fourth or lowest Foot-level, September 10, 1873.

No. 6201, a Chert pebble, which had undergone some chipping and probably subsequent rolling, was found by

itself in the Breccia, in the second Foot-level, September 18, 1873.

No. 6204, a chip which had the appearance of having been artificially struck off a Flint nodule, the original surface of which it retained on one face, was found, with a few fragments of bone, in the Breccia, in the third Foot-level, September 23, 1873.

No. 6291, a piece of coarse Chert, having the form of a horseshoe-shaped Scraper, was about 2.1 inches long and broad, and .7 inch in greatest thickness, sharply truncated at one end, and the "bulb of percussion" was well developed near it on the inner face, but everywhere else its margin was a thin edge. It was found alone, in the Breccia, in the fourth Foot-level, November 29th, 1873.

No. 6292, found on the same day and in the same Parallel and Level as No. 6291, but about three yards on the left of it, was a portion of white Flint, probably a Core from which flakes had been struck. It retained a part of the original surface of the nodule. No other object was found near it.

No. 6299 was a rude flake of Chert having little or nothing about it suggestive of an artificial origin. It had undergone the metamorphosis so frequently observed in cave Flints, giving it a granular chalky texture and a loss of weight. It was found without any other object, in the Breccia, in the third Foot-level, December 8th, 1873.

No. 6358, a coarse Chert tool, which had also been metamorphosed, was of a very irregular nondescript form, and remained partially surrounded with Breccia. It was met with in the second Foot-level, February 3rd, 1874, and was unfortunately broken by the workmen.

No. 6364, a rather rude flake of coarse Chert which had been rolled since it was struck off, retained much of the original surface of the nodule, and, though perhaps not intentionally fashioned as a Tool, may have been utilized. It was found, with a tooth of Bear, bones, and fragments of bone, in the Breccia, in the third Foot-level, February 14th, 1874.

No. 6367, an angular chip of Flint, was found, with 2 teeth of Bear and fragments of bone, in the Breccia, in the fourth Foot-level, February 23rd, 1874.

The entire number of noteworthy specimens of Flint and Chert (most of which, at least, have been made and used by man) which the Committee have found in the Breccia in the Long Arcade amounts to 27.

The materials which Mr. Mac Enery had dug up and cast aside in that part of the Arcade explored during the period over which the present Report extends were found on examination to contain 13 teeth of Hyæna, 9 of Bear, 8 of Horse, 2 of Deer, 1 of Ox, several bones, numerous lumps of coprolite, and 1 Flint flake (No. 6328). The specimens thus overlooked or neglected by the earlier explorers, but recovered by the Committee in the Long Arcade, from first to last, were 63 teeth of Hyæna, 15 of Horse, 9 of Bear, 7 of Rhinoceros, 4 of Deer, 3 of Ox, 1 of Elephant, 1 of Fox, numerous portions of bones and of antlers, a large quantity of fæcal matter, and 9 Tools and flakes of Flint and Chert.

Underhay's Gallery.—At about 185 feet from the junction of the Long Arcade with the Sloping Chamber there is in the left or eastern wall, as already stated, a small branch, to which the Superintendents have given the name of "Underhay's Gallery," after the late Mr. John Underhay, for some years Sir L. Palk's guide to the Cavern. Before the Committee commenced its exploration its mouth was almost closed with the large masses of Limestone mentioned in the Ninth Report as lying in wild confusion beyond the Bridge. (See p. 336 above.) Nevertheless Mr. Underhay and his son forced a passage into this Gallery several years ago, even though after passing the Entrance they must have found the Granular Stalagmitic Floor within a foot of the roof in certain places. They contrived, moreover, to bring back several small bones, which proved to be phalanges of Human feet, which they had found *on* and *in* the Floor.

The Gallery extended about 20 feet in a south-easterly direction, varied from 2·5 to 7 feet in width, and, when measured from the bottom of the excavation made by the Committee, from 7·5 feet at the Entrance to less than 6 feet in height within. The roof and walls had the appearance of an old watercourse, and were worn smooth, with but little of that fretted character so prevalent in some other branches of the Cavern. Near the mouth there were four circular holes in the right wall, about 6 inches in diameter, which looked like the mouths of "flues," but were found to extend not more than a foot into the rock and to run into one another. A Floor of Granular Stalagmite, never exceeding 10 inches in thickness, extended from the mouth to 16 feet within it, where it "thinned out." Beneath it there were, in certain places, chiefly adjacent to the left wall, remnants of the Crystalline Stalagmite *in situ*; but the greater part of this older Floor

had, as in many other parts of the Cavern, been broken up by some natural agency.

With rare exceptions, a thin layer of Cave-earth lay at once on the Breccia without any Stalagmite between them. *In* the Breccia itself, however, there were numerous fragments or blocks of Stalagmite which could not but be regarded as remnants of a Floor still older than the Crystalline Stalagmite found *on* the Breccia. Similar indications of this Floor, of what may be called the third order of antiquity, had frequently been met with elsewhere in the Cavern, and mentioned in previous Reports. (See p. 231 above.) The Breccia was extremely hard, and had to be split out with wedges to the depth of 2 feet. This, added to the contracted dimensions of the Gallery, rendered the work probably the most severe that has been experienced in the Cavern from the commencement.

Though the Human bones found by Mr. Underhay *on* and *in* the Granular Stalagmite, as already mentioned, did not appear, from their aspect or specific gravity, to be of an antiquity equal to that of the Cave-hyæna and his contemporaries, the Superintendents, in the hope of finding some further traces of the skeleton, watched most carefully the progress of the work; and on reaching Mr. Underhay's very limited diggings, they met with a series of bones also *on* and *in* the Stalagmite, some of which were certainly Human, whilst others were as clearly infra-human. The whole were at once forwarded to Mr. George Busk, F.R.S., &c., a member of the Committee, who has been so good as to prepare the following report on them. They were all numbered 6261, 6262, &c., 6285, 6286, 6287, &c., and so on.

MR. BUSK'S REPORT.

"I. *Human*.

- | | |
|---------|---|
| No. | |
| " 6261. | 1. Lower end of left humerus. |
| " 6285. | 1. Right astragalus (small size). |
| " | 4. Fragment of rib. |
| " | 5. Do. do. |
| " | 6. Second phalanx of fourth finger. |
| " | 7. Fragment of proximal epiphysis of humerus. |
| " | 8. Fragment of eleventh or twelfth rib. |
| " | 9. Fragment of cervical vertebra. |
| " 10. | Fragment of rib (?) |
| " 11. | Navicular bone. |
| " 12. | A trapezium. |

- No.
- "13. Fragment of rib.
 - "14. Fragment of cervical vertebra.
 - "15. Fragment of rib.
 - "17. Second phalanx of fourth toe.
 - "18. Do. do. do.
 - "6289 1. Fragment of rib.
 - " 2. Right patella.
 - " 3. Right first metatarsal.
 - " 4. Right ectocuneiforme.
 - " 6. Fragment of cervical vertebra.
 - " 7. Fragment of lumbar (first) vertebra.
 - " 8. Fragment of axis vertebra.
 - " 9. Fragment of cervical vertebra.
 - "10. Do. do. do.
 - "13. Second phalanx of little finger.
 - "14. Fragment of rib.
 - "15. Fragment of cervical vertebra.

"II. *Not Human.*

- No.
- "6285. 2. Gnawed fragment of small cannon-bone of Sheep or Goat.
 - " 3. Fragment of shaft or humerus of very young Sheep or Goat.
 - " 6. Ungual phalanx of very small Sheep (not Goat nor Roebuck).
 - "6289. 5. Ectocuneiforme of very large Deer.
 - "11. Fragment of tooth of ?
 - "12. A tooth ?
 - "6261. 1a. Fragment of skull of ?

"With respect to the human remains, they appear to be those of an adult individual of small size and delicate make, probably therefore, at that period, a female; but it is impossible to speak positively as to this. I should imagine them not necessarily of any very remote antiquity.

"The Sheep must have been of the smallest Welsh type.

"There are two or three specimens of a much more ancient type. One of these ($\frac{5}{8} \frac{1}{4} \frac{1}{8}$) is the ectocuneiforme of a Deer as large, I imagine, as the Wapiti Deer. Another is the fragment of a large tooth ($\frac{1}{4} \frac{1}{4} \frac{1}{8}$), it may be of Bear or Hyæna; and the third ($\frac{5}{8} \frac{1}{4} \frac{1}{8}$) is a single-fanged tooth of singular form, which may by remote possibility be a premolar of a large Bear. These specimens are in a widely different mineral condition from that of the human and ovine remains.

(Signed) "GEORGE BUSK."

"32, Harley Street, January 3rd, 1874."

When the very contracted character of this Gallery, before its excavation by the Committee, was borne in mind, it was difficult to understand how the remains were introduced. There were neither potsherds, nor charcoal, nor, in short, any thing

suggesting that the bones were the remnants of a body disposed of by cremation, such as were met with in the Charcoal Cave (see pp. 322-5 above); nor were there any marks of teeth on the bones such as might have been expected had they been taken thither by a carnivorous animal, or if they were the relics of a skeleton buried or secreted there, of which all other portions had been carried off by some carnivore.

The commingling of a few specimens of a more ancient type with the comparatively recent Human and Ovine remains was no doubt produced by Mr. Underhay's diggings at the spot.

Besides the foregoing specimens no object of interest was found in connexion with the Granular Stalagmite.

The Cave-earth in Underhay's Gallery yielded 2 balls of coprolite, numerous bones, and 94 teeth, of which 61 were those of Hyæna, 22 of Horse, 4 of Rhinoceros, 4 of Fox, 1 of Bear, 1 of Lion, and 1 probably of Wolf.

The following specimens of Flint and Chert were also met with in the Cave-earth:—

No. 6234, a mere angular chip of drab-coloured Flint, was found, with 1 tooth of Hyæna and 1 of Rhinoceros, in the Cave-earth, in the first Foot-level, October 14, 1873.

Nos. 6235, 6236, and 6237, three small fragments of Flint (two of them angular and the third subangular), having no appearance of having been artificially formed, were found, with 7 teeth of Hyæna and 1 of Fox, part of a jaw of Fox, part of a skull, and a gnawed bone, in the Cave-earth, in the first Foot-level, November 10, 1873.

No. 6289, a small bit of Flint, found, with 15 teeth of Hyæna, 7 of Horse, 1 of Bear, and a few bones, lying on the Cave-earth in the innermost part of the Gallery, beyond the point at which the Granular Stalagmite had thinned out.

The Breccia in Underhay's Gallery produced several bones, 115 teeth of Bear, and the following specimens of Flint and Chert:—

No. 6220, an irregular Flint chip, which had been somewhat rolled, was found, with three teeth of Bear and fragments of bone, in the Breccia, in the second Foot-level, October 3, 1873.

No. 6221, apparently a Flint Core, retaining a portion of the original surface of the nodule, was found, with three teeth of Bear, also on October 3, 1873, and one foot below No. 6220.

No. 6278, a rolled flake of Chert found with No. 6277.

No. 6279, a flake of Chert imbedded in the Breccia, was found, with bone fragments, in the second Foot-level, November 17, 1873.

No. 6281, a small flake of Chert, found, with three fragments of teeth of Bear, and pieces of bone, in the Breccia, in the fourth Foot-level, November 18, 1873.

The Breccia in this Gallery also yielded a piece of iron-ore and a small piece of umber.

The Inscribed Boss of Stalagmite.—Though inscriptions exist in various parts of the Cavern, the huge mass of Stalagmite, standing at the point where the Long Arcade, the Cave of Inscriptions, and Clinnick's Gallery meet, is, with the exception perhaps of the Crypt of Dates (see p. 254 above) more thickly scored with names, initials, and dates than any other equal area within the Cavern. Indeed, it seems to have been the spot where visitors usually left their names. Those alone who were sufficiently adventurous and expert to get beyond the Lake could leave a proof of the fact in the Crypt. The Boss, which may be described as a frustrum of an oblique cone, measures 43 feet in basal circumference and 14 feet along the slant side, which, forming an angle of 70° with the horizon, gives a vertical height of fully 13 feet. The contents are probably not less than 630 cubic feet of Stalagmite. Its base consists of the Crystalline Stalagmite, and the upper portion (without any intervening Cave-earth), of the Granular variety, which not only surmounted and completely encased the former, but, by flowing in vast sheets, formed the thick Granular Stalagmite Floor spreading far, and without a break, in every direction. At a few feet from the Boss, the Cave-earth occupied its place between the Stalagmites.

The inscriptions occupy its outer or most accessible semi-surface, where in certain places they form quite a network. Letters of all sizes, from some fully three inches in height to others as small as ordinary writing, cross each other and add to the difficulty of decipherment. Some of them were cut with great care and finish, and must have occupied a large amount of time, whilst others were but hasty scratches.

It seems to have been somewhat fashionable to surround the inscriptions with rectangular parallelograms, varying from 6·5 to 3·75 inches in length by 5·5 to 3·5 in breadth. In, at least, one or two cases the cutting of the parallelogram preceded that of the inscription, as the latter extends beyond the space intended. Not unfrequently several names occur

together, whether within a parallelogram or not, and in each such case the entire work seems to have been performed by the same hand. The following, which are the most legible, may suffice as examples :—

- | | |
|---|--|
| <p>*1. PETER LEMAIRE
RICH: COLBY OF
LONDON. 1615.</p> <p>2. THOMAS TRENHELE
1617.</p> <p>3. IANE
PRIDE
ALIXI
1626 †</p> <p>4. 16 [??] ‡
AMBROSE LANE
MILDRED
TORKINTON</p> <p>5. JOHN TAYLOR
1700</p> <p>6. VIZARD
1809</p> | <p>7. R. H. THOMAS
LONDON
1811</p> <p>8. RICHARD
LANE. FEB.</p> <p>9. M. CHAMPERNOWNE
GILBART
STAPLYN §</p> <p>10. DELVC</p> <p>11. W. P. WILLIS</p> <p>12. N. I. FURSE</p> <p>13. W. WISH</p> <p>14. I. WISH</p> <p>15. R. LEAR</p> <p>16. R. CRAMPTON</p> <p>17. JOB. F. LIEVR</p> |
|---|--|

Of the foregoing names, No. 10 may perhaps be that of Mr. J. A. DELUC, F.R.S., &c. He visited Torquay in October, 1805, but, as the following passage in his *Geological Travels* shows, did not apparently enter the Cavern at that time. Speaking of the "*lime-stone strata*," between Babbacombe and Tor Bays, he says, "There is, as I was told, a succession of caverns within this mass, resembling those of the *Mendip hills*, which I shall hereafter describe: the Caverns here have the name of *Kent's Cave*." (ii. 300.) This appears to be the only mention he made of the Cavern. The inscription is in comparatively small capitals, which, though no great pains appear to have been bestowed on

* The numerals prefixed to the inscriptions form no part of the original. Mr Mac Enery, who copied some of these inscriptions, appears to have made a few mistakes. Thus, in No. 1, instead of "Lemaire" his copy is "Lemaine," and instead of "Colby," "Calley;" and in No. 4, instead of "Torkinton," "Torkington." (See *Trans. Devon. Assoc.* iii. 275.)

† The first three lines of No. 3 are within a parallelogram, 4'75 in. x 3'25 in., having the date, which seems clearly to belong to it, immediately below. It does not seem easy to attach a meaning to the third line.

‡ The last two figures of the date in the upper line of No. 4, represented above by two notes of interrogation within brackets, are illegible.

§ The characters employed in No. 9 are very peculiar, and are the same for the three names, which are close together, and were clearly inscribed at the same time.

them, are very distinct, and stand immediately above the parallelogram containing the inscription No. 1.

The name of Champernowne (No. 9) is that of a well-known Devonshire family now represented by A. Champernowne, Esq., M.A., F.G.S., of Dartington Hall, near Totnes, the seat of his ancestors for many generations. It is worthy of remark, perhaps, that the mother of Sir Humphrey Gilbert, born near Torquay, the half-brother of Sir Walter Raleigh, was a Champernowne. In the inscription, however, the name is Gilbert, not Gilbert. Whether "Staplyn," also in No. 9, is the name of a person or of a place, there seems to be no mode of determining; but it may be observed that "Staple" is the name of a hamlet in the parish of Dartington. [It should be added that there is in St. Saviour's Church, at Dartmouth, a brass effigy of Gilbert Staplehill, once Mayor of the town. He died 15th February, 1637. See *Trans. Devon. Assoc.* viii. 713-714.]

Some of the names inscribed on the boss are no doubt those of persons of the immediate neighbourhood. "W. Wish" (No. 13) was the name of one of the principal builders at Torquay when Mr. Mac Enery's Cavern researches were in progress, and he had a nephew named "James Wish" (No. 14). The name of "Lear" (No. 15) is very prevalent in the district.

It must be unnecessary to add that every care has been taken to preserve this Boss with its inscriptions uninjured.

The Cave of Inscriptions.—There are two Entrances to Clinnick's Gallery between the Inscribed Boss of Stalagmite and the northerly wall of the Long Arcade; in fact the original Entrance was partially filled, and thus converted into two, by the Boss. As the smaller, that is the westernmost, of the two Entrances was the more convenient for excavating the Gallery, it was decided to complete the exploration of the Cave of Inscriptions so far as to render this Entrance available, that is up to 16 feet from its commencement. Mr. Mac Enery had not broken ground in any part of this area, and the Granular Stalagmitic Floor was everywhere intact and continuous from the slopes of the Inscribed Boss. The Crystalline Stalagmitic Floor lay beneath it, and, as already stated, formed the base of the Boss without any intermediate deposit; but towards the left or remote wall of the Cavern there was a space between them filled with a wedge-like layer of Cave-earth. Not unfrequently, however, the lower or Crystalline Stalagmite had been broken. In some instances

the severed portions were not dislodged, while in others considerable masses had been removed by some natural agency, and were not always traceable.

In this commencement of the Cave of Inscriptions the Cave-earth yielded 20 teeth, of which 11 were those of Bear, 5 of Elephant, 3 of Hyæna, and 1 of Horse. There were also several bones, of which 6 had been burnt and a few gnawed; and a considerable quantity of coprolitic matter was met with in 14 distinct "finds."

The following specimens of Flint and Chert were also found in the Cave-earth in this branch of the Cavern:—

No. 6378, a mottled, grey, angular flake of Chert, 2·3 inches long, 1·5 inch broad, ·3 inch thick, very concave on the inner face, had had several flakes struck off the outer face. There was little or no evidence of its having been used, and it was found, with two plates of Elephant's molars, 2 teeth of Bear, gnawed bones, 1 burnt bone, and 5 lumps of coprolite, in the Cave-earth, in the first Foot-level, March 6th, 1874.

No. 6382, a small grey Flint flake or chip, with the "bulb of percussion" strongly marked, was found in the Cave-earth, in the first Foot-level beneath a cake of Stalagmite 12 inches thick, with 3 teeth of Bear and 11 balls of coprolite, March 11th, 1874.

No. 6384, a rudely lanceolate flake of grey Flint, 2·2 inches long, ·9 inch in greatest breadth, ·3 inch in greatest thickness, slightly concave on the inner face, reduced to an edge along both lateral margins, having two ridges extending its entire length on the outer face, and but little, if at all, used, was found, with 4 teeth of Bear, fragments of bone, and a coprolite, in the first Foot-level of Cave-earth, March 13th, 1874.

No. 6390, a small Flint flake, 1·4 inch long, ·8 inch in greatest breadth, ·3 inch in greatest thickness, slightly concave in both directions on the inner face, strongly carinated on the other, sharply truncated at each end, reduced to an edge on the lateral margins, one of which was broken or jagged, of a light drab colour on the surface and to some depth below it, but retaining the original almost black colour at the centre, was found in the first Foot-level of the Cave-earth, beneath 10 inches of Granular Stalagmite, with 1 tooth of Bear, 2 fragments of burnt bone, and 4 lumps of coprolite, March 24th, 1874.

No. 6399 was a nearly white Flint of fine texture, 2·9 inches

long, varying from .7 to .9 inch broad, .5 inch in greatest thickness, sharply truncated at the but-end, round-pointed and blunt at the other, sharp and unworn at the lateral margins, longitudinally concave on the inner face, and having a strong central ridge on the other extending from the but-end nearly two thirds of its length, where it bifurcated in consequence of the dislodgment of a small flake, which left an uneven surface. At the but-end there was on one of the slopes a portion of the original surface of the nodule about an inch long, and the "bulb of percussion" was well developed near the point. It was found, with 2 fragments of bone and 2 lumps of coprolite, in the first Foot-level of the Cave-earth beneath the Granular Stalagmite 24 inches thick, on April 1st, 1874.

No. 6435, a grey Flint flake, 1.5 inch long, .7 inch broad, .35 inch in greatest thickness, which it attained on one of its lateral margins, sharply truncated at one end, round-pointed and blunt at the other, where, on the inner face, the "bulb of percussion" presented itself, reduced to a thin edge along one of its lateral margins, where there were indications of its having been used as a Scraper. On its outer face it had, for a short distance near the middle of its length, a central ridge which bifurcated towards each end. It was found in the Cave-earth, in the first Foot-level on May 28th, 1874.

Nothing was met with in the Crystalline Stalagmite; but the Breccia beneath it yielded remains of Bear as usual, including numerous bones and fragments of bone and 91 teeth, but, so far as is known, no trace of any other animal.

The following specimens of Flint and Chert were also met with in the Breccia:—

No. 6375, a large rude flake of a very rough Flint nodule, which had undergone sufficient metamorphosis to produce a granular texture and render it capable of being scratched with a knife, but without any marked loss of weight. Its form was rudely quadrilateral with the angles rounded off. The inner face displayed the "bulb of percussion" near the truncated but-end, but elsewhere had a tendency to flatness. The outer face retained a large portion of the original surface of the nodule. It was 4.25 inches long, 3 inches broad, 1.5 inch in greatest thickness, and was found in the fourth Foot-level of the Breccia, with 2 teeth of Bear and a small Flint pebble, March 3rd, 1874.

No. 6388, a bluish-grey Flint of somewhat coarse texture, 2 inches long, .7 inch broad at the truncated but-end, whence

it tapered to a point at the other, $\frac{1}{4}$ inch in greatest thickness, slightly concave on one face and very strongly ridged on the other. It was found, with 2 teeth of Bear and fragments of bone, in the second Foot-level of Breccia, March 17th, 1874.

No. 6392, an irregularly shaped flake or chip of pinkish drab Chert, 2·2 inches long, 1·8 inch broad, and $\frac{1}{3}$ inch in greatest thickness, was found, without any other object of interest, in the third Foot-level of the Breccia, in March 25th, 1874.

No. 6396 was a subtriangular flake of coarse Chert, 1·8 inch long, 1·1 inch in greatest breadth, $\frac{1}{4}$ inch in greatest thickness, nearly flat on one face and had a strong curvilinear ridge on the other. It was found, with fragments of bone, in the Breccia, in the first Foot-level, March 31st, 1874.

No. 6455, a small specimen, or rather a portion of one, it having been broken in extracting it from the matrix, was $\frac{1}{9}$ inch long, scarcely $\frac{1}{5}$ inch broad, and $\frac{1}{2}$ inch in thickness which it retained to each of its lateral margins. It was found, with fragments of bone, in the Breccia, in the fourth Foot-level, June 19th, 1874.

Clinnick's Gallery.—This branch of the Cavern, the original Entrance to which, as already stated, was divided into two passages by the Inscribed Boss of Stalagmite, was really discovered and laid open by the Cavern Committee. Up to April, 1874, it was always believed that what proved to be the Entrance to a long tortuous gallery and a series of chambers was nothing more than a very small recess.

One of the spots selected for a limited exploration by the Committee appointed in 1846 by the Torquay Natural History Society (see p. 192 above) was the narrower of the two passages just mentioned—that on the south-western side of the Inscribed Boss. Mr. Vivian, a member of that Committee, speaking of a Flint tool found there, said "In the spot where the most highly finished specimen was found the passage was so low that it was extremely difficult, with quarrymen's tools and good workmen to break through the crust; and the supposition that it had been previously disturbed is impossible." (See *Rep. Brit. Assoc., Proc. of Secs.* 1847, p. 73; or *Trans. Devon. Assoc.* ii. 518.)

The work by that Committee was performed as in all previous cases—the excavated materials were examined in candlelight as they were dug out, and then thrown on one side, but not taken out of the Cavern to be re-examined in daylight. The excavation then made was about 7·5 feet long,

5 feet broad, and penetrated to a depth of not more than 2 feet below the bottom of the Granular Stalagmitic Floor. The materials cast aside in 1846 were taken out of the Cavern by your Committee, and the following objects found in them:—7 teeth of Bear, 1 of Fox, and 13 lumps of coprolite. Before its removal, the surface of the mass was carefully examined to ascertain what thickness had been reached by the Stalagmite which, as the Superintendents well knew, had been accreting on it since its lodgment in the spot it had occupied for 28 years beneath one of the overhanging walls of the Cavern: the result was a film of the thickness of writing-paper only, and limited to two examples of from 2 to 3 square inches each. The Granular Stalagmitic Floor so very nearly reached the Roof as to lead at first to the conclusion that the entire Gallery was exposed to view; but as the work advanced the space between the Floor and Roof became steadily greater, until John Clinnick, the workman after whom the Gallery was named, was able to force himself through the low tunnel, and to enter a chamber which he spoke of as being large, and beautifully hung with Stalactites.

This Gallery, up to the point at present explored, had a perfectly continuous Floor of Granular Stalagmite before it was broken in 1846, as already stated. It varied from 14 to 30 inches in thickness; and, at about 3 feet from the base of the Inscribed Boss there rose from the Floor another, in the form of a tolerably regular paraboloid, which, though dwarfed by its gigantic companion, would have arrested general attention elsewhere. It measured 10 feet in basal circumference, 3 feet in height, and had to be blasted in order to effect its removal, when it was found to be pure Stalagmite throughout.

Up to 18 feet from the Entrance of the Gallery a small quantity of Cave-earth uniformly presented itself, beneath which lay the Breccia occasionally separated from it by remnants of the Crystalline Stalagmite Floor *in situ*; but at the point just mentioned the Granular Stalagmite rested immediately on the Crystalline, and that on the Breccia; and this condition has been retained up to the present time, that is through a length of 16 feet. The Committee, however, are not unprepared to find, as the work progresses, Cave-earth, at least in the form of "pockets," between the two Floors, with its characteristic remains, as was the case in the Southwest Chamber. (See p. 252 above.)

The Cave-earth in Clinnick's Gallery has up to this time yielded 8 teeth of Hyæna, 2 of Fox, a tolerable number of

bones, 13 "finds" of coprolite, and the following specimens of Flint and Chert:—

No. 6401 was a rather large Chert Implement broken into several pieces by a blow of the workman's tool. It was found on April 7th, 1874, with a tooth of *Hyæna*, in the first Foot-level of the Cave-earth, on which the Granular Stalagmite was 24 inches thick.

No. 6426 was a small white Flint flake, 1·3 inch long, 1 inch broad, ·3 inch in greatest thickness, nearly flat on one face, strongly ridged rather near the margin on the other, blunt at the ends, but reduced to a thin edge everywhere else; one margin was nearly straight, whilst the other was an almost circular arc, giving the specimen a semicircular form. It had undergone the prevalent metamorphosis, and was found, May 12th, 1874, in the first Foot-level of Cave-earth.

The Breccia in this Gallery had produced, up to the end of July, 1874, 86 teeth of Bear, numerous bones, including a large portion of a skull (No. 6458), and the following specimens of Flint and Chert:—

No. 6403, a pinkish drab flake of Chert, somewhat pentagonal in form, about 2·1 inches long, 1·5 inch broad at what may be regarded as its front edge, ·45 inch in greatest thickness, and probably an efficient Scraper, was found alone April 15th, 1874, in the fourth Foot-level of the Breccia.

No. 6415, a pinkish drab flake of Chert, 2·2 inches long, 1 inch broad, ·35 inch in greatest thickness, with the "bulb of percussion" on the inner face, which was concave in both directions, while the outer face was convex and retained the original surface of the nodule on about one third of its length. It did not appear to have been used, but a considerable part of its margins was concealed by portions of the Breccia. It was found, with 3 teeth of Bear, April 28th, 1874, in the first Foot-level of the Breccia.

No. 6427, an irregular pentagon in form, 2·9 inches in length, 2·4 inches in greatest breadth, ·9 inch in greatest thickness, nearly flat on one face—which showed the "bulb of percussion"—and convex on the other, whence several flakes had been dislodged leaving conchoidal facets. It was probably reduced to a thin edge along each of its sides except one, and had been pretty much used. It was found May 14th, 1874, with fragments of bone, in the fourth Foot-level of the Breccia.

No. 6462, a rough irregular flake, 2·4 inches in length, 1·2 inch in greatest breadth, and ·5 inch in greatest thickness,

was found, with a Bear's tooth, and a few fragments of bone, in the fourth Foot-level of the Breccia, on July 10th, 1874.

No. 8411, was found April 23rd, 1874, in the Breccia, in the fourth Foot-level, with 1 tooth of Bear, fragments of bone, and a small Chert flake (8411) which had probably been rolled. It measured 4·5 inches in length, 3 inches in greatest breadth, 1·1 inch in greatest thickness, was very convex on one face, slightly so on the other, retained a portion of the original surface near the but-end, and was rudely quadrilateral in form with the angles rounded off. Several flakes had been struck off each face; the edge to which it had been reduced along its entire margin, except at the but-end, was by no means sharp; its surface was almost entirely covered with an almost black, probably manganic, smut, while a slight chip near the pointed end showed it to consist of a very light-coloured granular Chert. Several lines, betokening planes, probably, of structural weakness or perhaps of fracture, entirely surrounded it. If it had really been fractured, it must have occurred where the Tool was found, and the parts had been naturally reunited without being faulted. Its character, as well as its position, showed that this fine Implement belonged to the era of the Breccia.

This specimen was of considerable interest, both on account of the lines which crossed its surface and of the position it occupied.

Among the Flint implements found in Brixham Cavern, that known as No. 6-8 attracted considerable attention, and was described and figured by Mr. John Evans, F.R.S., a member of the Committee, both in his "Ancient Stone Implements" (Fig. 409, pp. 468-9), and in the "Report on the Exploration of Brixham Cave." (*Phil. Trans.* clxiii. 550-1; see also *Trans. Devon. Assoc.*, vi. 833-4.) It was found in two pieces—the first on the 12th of August, 1858; the second, 40 feet from it, on the 9th of the following September; and it was not until some time after the latter date that the late Dr. Falconer discovered that the two fragments fitted each other and when reunited formed a massive spear-shaped Implement. The lines on the Kent's Cavern Implement just described (8411) showed that it had either been fractured where it was found, or, what seemed more probable, that it was traversed by planes of structural weakness, such that a slight blow would break it into two or more pieces, which a stream of water might easily move and probably separate, and thus produce a repetition of the Brixham case.

The Kent's Cavern Tool was found in a small recess in the

wall, just within the wider Entrance of Clinnick's Gallery, a very few feet from the Inscribed Boss of Stalagmite, and, as has been already stated, in the fourth Foot-level of the Breccia—that is, at the greatest depth in the oldest of the Cavern deposits to which the present exploration has been carried; and is thus wonderfully calculated to take the mind step by step back into antiquity.

First, very near the spot occupied by the specimen there rises a vast cone of Stalagmite, which an inscription on its surface shows has undergone no appreciable augmentation of volume during the last two and a half centuries.

Second, before that was the period spent in rearing the greater portion of this cone, which measures upwards of 40 feet in basal girth, reaches a height of fully 13 feet, and contains more than 600 cubic feet of Stalagmitic matter.

Third, still earlier was the era during which the Cave-earth was introduced in a series of successive small instalments with protracted periods of intermitence, when the Cavern was alternately the home of Man and of the Cave-Hyæna, and the latter dragged there piecemeal so many portions of extinct Mammals as to convert the Cave into a crowded palæontological Museum.

Fourth, further back still was the period during which the base and nucleus of the cone or boss was laid down in the form of Crystalline Stalagmite.

Fifth, and earliest of all, was the time when materials, not derivable from the immediate district, were carried into the Cavern through openings now probably choked up, entirely unknown, and the direction in which they lie but roughly guessed—when, apparently, the Cavern-haunting Hyæna had not yet arrived in Southern England. At an early stage in this earliest era Man occupied Devonshire; for before the introduction of the uppermost four feet of the Breccia one of his massive unpolished Tools, rudely chipped out of a nodule of Chert, found its way into a recess in the Cavern, where, as its characters show, it must have lain undisturbed until it was detected by a Committee of the British Association.

It may be of service before closing this Report to show, in a tabular form, the distribution of the different kinds of Mammals in the Cave-earth in various portions of the Cavern up to the present time.

TABLE XIX.—Showing how many per cent. of the Teeth
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found in the Cave-earth, in different branches of the Cavern, belonged to the different kinds of Mammals.

	South Sallyport.	North Sallyport.	Smerdon's Passage.	Sloping Chamber.	Wolf's Cave.	Cave of Rodentia.	Charcoal Cave.	Long Arcade.	Underhay's Gallery.
Hyæna . . .	27	31	43	39	44·5	44	29·5	41·5	65
Horse . . .	29	31	27	28·5	25	28	33	21	23·5
Rhinoceros . . .	11	16	15	14	15	9·5	10·5	9	4·25
Bear . . .	8	1	2	2·5	3	3	3·5	14·5	*
Sheep† . . .	7	·5	...	...	·5	·5	1	...	...
Badger . . .	3	4	2·5	...	...	...	6	...	...
Fox . . .	3	·5	1·5	...	*	*	12	4·5	4·25
Rabbit . . .	3	2	·1	...	·5	...	...	...	...
Elephant . . .	2	2	·2	1·5	2·5	1	1	2	...
Deer‡ . . .	2	6	7	8·5	5·5	9·5	...	3	...
Lion . . .	2	2	·5	1	1	...	...	1	*
Ox . . .	1	·5	3	2	1	2	1	...	...
Wolf (?) . . .	·5	...	·5	1	1	*	2·5	...	*
Hare . . .	·5	·5	...	...	...	...	...	...	...
Dog (?) . . .	·5	...	·25	*	...	...	...	1	...
Pig . . .	·5	·5	...	...	...	...	...	2·5	...
Beaver . . .	...	·5	...	...	...	...	...	...	...
Bat . . .	...	...	·15	...	...	...	...	...	...
Machairodus . . .	...	...	...	...	...	...	...	*	...

No trace of *Machairodus* has been met with since the Eighth Report (1872) was presented.

ELEVENTH REPORT. Read at Bristol, August, 1875. (See *Rep. Brit. Assoc.* 1875, pp. 1-13.)

The Committee have again the melancholy duty of reporting that death has deprived them of one of their members. As long ago as 1859, as soon as he became aware of the importance of the discoveries made in the Windmill Hill Cavern at Brixham, Sir Charles Lyell expressed a strong desire that Kent's Cavern should also be systematically and thoroughly explored; and it was with his full concurrence that the proposal to do so was laid before the Committee of the Geological Section of the British Association at Bath in 1864, the day after he delivered his Presidential Address; while his ardent advocacy, together with that of the late Pro-

† There is reason to believe that the remains of Sheep found in the Cave-earth had been introduced in comparatively recent times by burrowing Carnivores.

‡ The "Irish Elk," Reindeer, Red Deer, &c., are all included in the general name "Deer."

The asterisks in the Table denote that only one tooth was found.

fessor Phillips, secured its ready acceptance by the Committee of Recommendations and the General Committee. At the first meeting of the Cavern Committee, appointed in the year just mentioned, he was unanimously elected Chairman, and he continued to occupy that post until his lamented decease on 27th February, 1875. Though the state of his health prevented him from taking any active part in the exploration, his interest in the work never abated, and he always carefully studied the Monthly Reports of Progress sent him by the Superintendents.

The Committee have the satisfaction of stating that they still retain the services of George Smerdon, foreman of the work, who has been engaged on it from the beginning. As John Clinnick, the second workman, believing the employment prejudicial to his health, has found more congenial labour, they have engaged Nicholas Luscombe in his stead, and hope that he may prove an equally satisfactory workman.

Clinnick's Gallery, continued :—The Tenth Report stated that the Committee had discovered that the Long Arcade, about 225 feet from its Entrance, threw off a narrow branch, which had been named "Clinnick's Gallery" after the workman who first entered it; that its exploration was in progress and had been completed for about 34 feet; that below the Granular Stalagmitic Floor, for a distance of 18 feet from the Entrance, a small quantity of Cave-earth uniformly presented itself, beneath which lay the Breccia, occasionally separated from it by remnants of the Crystalline Stalagmitic Floor *in situ*; but that from the point just named, up to that reached when the Tenth Report was drawn, there was no Cave-earth, so that the two Stalagmites lay the one immediately on the other, with the Breccia beneath the whole.

The work in Clinnick's Gallery was very difficult, as the two Stalagmites were not only extremely hard and tough, but had an aggregate thickness amounting frequently to fully four feet; and the very contracted height and breadth of the Gallery prevented the men from working to the best advantage.

The state of the Floor was a puzzling study. The Crystalline Stalagmite was broken in places near to, and parallel with, the left wall, and the fragments, occasionally considerable sheets, were raised some inches above their original level at their margin most remote from the wall, and depressed at

that nearest to it, while every thing remained intact at, and adjacent to, the opposite wall of the narrow Gallery. The disturbance occurred obviously before the commencement of the formation of the Granular Stalagmite; for not only was this less ancient Floor undisturbed, but the fragmentary and tilted sheets of the older Floor just mentioned passed in some instances obliquely through it, rising above its upper surface on one side and projecting below its base on the other. Adjacent to the left wall, at a point where the Floor was unbroken, a pap (which had evidently lost its top) reached the height of 16 inches and was still standing erect. Though varying somewhat in diameter, it may be said to be approximately cylindrical in form, and at the top it measured 10 inches in circumference. Almost in contact with it, but lying horizontally at its base and completely enveloped in the Granular Stalagmite, was a fragment of, no doubt, the same pap, 10 inches long. While on the opposite side of the standing portion was a third fragment, 5 inches long, terminating in a cone, and firmly held to the spot by Stalagmitic matter. There can be no doubt that the three pieces were portions of one and the same pap, of which the shorter piece was the conical apex, the unbroken column having been at least 31 inches long. Phenomena such as these are calculated to induce speculations respecting the causes which produced them and the time they represent. In the case just mentioned, we have, first, the deposition of the Breccia, or oldest of the Cavern deposits so far as is certainly known; this was followed by the formation of the Crystalline Stalagmite as a continuous sheet of somewhat variable thickness, which sometimes reached fully 3 feet in this Gallery; next came that very slow drip and precipitation of carbonate of lime which alone seems compatible with the formation of *paps*, and this continued until the pap just described had reached a height exceeding 30 inches and a girth of 10; this was succeeded by some cause of disturbance, which broke the thick floor of Crystalline Stalagmite, depressed, as if by subsidence, the deposit adjacent to one wall but left every thing intact on the opposite side of the narrow passage, broke the pap into three pieces, leaving the lowest of them still erect, causing the middle segment to fall at its foot on the outside, and that which formed the apex on the inside; finally, this was followed by another sheet-like floor of Stalagmite, of less thickness than the former, Granular in texture, and capable of preventing the results of the disturbance from being themselves disturbed. A faint earthquake-tremor would, no doubt,

suffice to break some of the long comparatively slender paps; for some of those which have been found detached have been known to resolve themselves into fragments, even at a touch, the planes of division being at right angles to the longest axis, whilst others of even less thickness will stand a considerable blow. Most of those standing intact emit a musical note when struck gently; and the notes are such as to show that the rates of vibration, and hence, probably, the molecular arrangement, must differ considerably even in masses of very nearly the same dimensions.

Clinnick's Gallery, on being excavated, was found to be a tortuous passage 75 feet long, varying from 4 to 8 feet in width, and from 7 to 10 feet in height. That it was once a watercourse there can be little or no doubt as the roof bears the marks of the long-continued action of a running stream. The walls vary considerably—being in some places smooth, in others much fretted or corroded, and in others more or less angular.

The objects of interest found in this Gallery during the last twelve months have been by no means numerous; nevertheless they are not without interest, as a few of them throw a new light on the palæontology of the Cavern.

Attached to the upper surface of the Granular Stalagmitic Floor, portions of three land-shells (No. 6477) were found, 23rd October, 1874; and on the 31st of the same month about 20 bones of Mammals (No. 6481), were met with, lying together loose on the Floor, beneath a few small fragments of Stalagmite. Their characters were such as to imply a recent introduction into the Cavern.

Incorporated in the Granular Stalagmite itself were a few bones, including a humerus (No. 6475), a tibia and ulna (No. 6476), all nearly entire, and a portion of a large humerus (No. 6491), each of which had been gnawed.

Though no Cave-earth was met with beyond the point already specified, there seems no doubt that to the era of that deposit may be referred a considerable portion of a radius (No. 6484), and of an ulna (No. 6489) both gnawed and found under loose pieces of Stalagmite.

The Breccia in this Gallery was not much more productive. The total remains of animals it has yielded since the last Report was presented were 4 teeth of Bear, a few bones and fragments of bone, and 3 teeth of Lion in three portions of,

no doubt, one and the same lower jaw. The latter "find" (No. 6482) is of considerable interest, as being almost the only remains of any animal besides Bear met with in the Breccia. (See pp. 239, 240 above.) It was found with three bits of bone on the 2nd November, 1874, in the third Foot-level; and vertically beneath it, in the fourth Foot-level, were 1 tooth of Bear, a fragment of bone, and a Flint chip (No. 6483). Though the Secretary had no doubt of the feline character of the teeth, he forwarded one of them (that least surrounded with Breccia) to Mr. George Busk, F.R.S., &c., a member of the Committee, on 30th November, 1874, remarking that he believed it to be the last lower left molar of *Felis spelæa*, and requesting his opinion on it. In his reply, dated "32, Harley Street, December 8, 1874," he remarked:—

"There is no doubt that the tooth is the left lower carnassial of *Felis leo*, but it is of very unusual size, being, I should estimate, $\frac{1}{3}$ bigger than the average dimensions of that tooth in the Lion. It is usually longer, but not so thick, in the Tiger than in the Lion; but the thickness of the present one is proportionate to its length, viz. $1.20 \times .65$ inch. Another peculiarity, as it seems to me, is the great wear that the tooth has undergone. I fancy existing Lions are not allowed to live long enough to wear their teeth so much. At any rate, the Kent's Hole tooth appears to be more worn than any other I have as yet met with. Can it belong to *Machairodus*?

(Signed)

"GEORGE BUSK."

Having succeeded in removing some part of the matrix encrusting the other portions of the jaw they were also forwarded to Mr. Busk, with the observation that the Secretary had carefully considered the question before submitting the first tooth, and had come to the conclusion that the jaw was not that of *Machairodus*; for, waiving the fact that none of the teeth were serrated, the fang of the canine still remaining in the jaw was much too large for a lower canine of any known species of *Machairodus*; and it was suggested that it might be worth considering whether the specimen belonged to any of the species of *Felis* found in the Forest-bed of Cromer. Mr. Busk said in his reply, dated August 11th, 1875:—

"The jaw does not appear to present anything unusual. It is, however, a good example to show that the Cave-Lion lived to a good old age.

(Signed)

"GEORGE BUSK."

Clinnick's Gallery yielded also 7 specimens of Flint and Chert belonging to the Breccia (Nos. 6466, 6467a, 6470, 6474, 6478, 6483, and 6485), of which the first alone requires further notice.

No. 6466, an irregular tongue-shaped tool, of gamboge colour externally, about 3 inches long, 1·7 inch in greatest breadth, and ·7 inch in greatest thickness, had been reduced to an edge all round the circumference except at the but-end, was slightly concave on the inner face—on which the “bulb of percussion” was well developed near the but-end—and very convex on the outer face, whence several flakes and chips had been dislodged. It was broken into three pieces by the workmen in extracting it, and was found, without any object of interest near it, on 8th August, 1874, in the third Foot-level of Breccia, over which the two Stalagmitic Floors, without any Cave-earth between them, had an aggregate thickness of 48 inches.

The comparative paucity of specimens in Clinnick's Gallery induced the Superintendents, on 1st December, 1874, to suspend operations there for, at least, a time. The labour of seven months had been expended on it, during which the exploration had reached 75 feet from the Entrance.

The following is a list of the objects of interest found in Clinnick's Gallery from first to last:—

Lying on the surface, and apparently recent: 3 shells of *Helix* and about 20 bones of Mammals.

Incorporated in the Granular Stalagmite: a few gnawed bones.

In the Cave-earth: 8 teeth of *Hyæna*, 2 of *Fox*, a tolerable number of bones and fragments of bone, 13 “finds” of coprolite, 1 large Chert Implement (No. 6401), and 1 small Flint flake (No. 6426).

In the Breccia: 90 teeth of *Bear*, 3 of *Lion* in portions of a left lower jaw (No. 6482), numerous bones and portions of bone, including a large part of a skull, a Flint pebble, and 11 specimens of Flint and Chert Implements, flakes, and chips, including the very fine tool No. 6411. (See p. 368 above.)

The Cave of Inscriptions, resumed:—The chamber in which the Long Arcade terminates was called by Mr. Mac Enery “The Cave of Inscriptions,” on account of the number of names, initials, and dates graven on the Stalagmite in various parts of it. Besides those on the Inscribed Boss of Stalagmite at the Entrance of the Cave, described in the

Tenth Report (see p. 361 above), inscriptions occur on what is known as "The Hedges Boss" and on the walls of the Chamber. There are also numerous names, &c., smoked on various parts of the Roof, as there are, indeed, in almost every part of the Western Division of the Cavern, some of which appear to be of considerable antiquity.

The southern wall, about 35 feet from the Entrance, is covered with Stalagmitic matter, having usually a rough surface, and to which there does not seem to have been recently any addition. On this surface the following inscriptions have been noticed:—

*1. I. O.	2. /W	3. A E	4. 1769
1609	1792		

No. 1 is in large, badly-cut characters.

No. 2 is in characters about 3 inches high, well cut, bold, and very legible. The letters are, of course, an economical form of NW.

No. 3 is badly cut, and immediately under No. 2.

No. 4 is in small characters.

There are several other inscriptions, but not sufficiently legible to be copied with certainty.

At the south-western corner of the Chamber the following inscriptions occur on the wall:

1. M . R.	5. I. B.	8. R. B
2. G. B.	6. William Mather	1661
3. HAGH	Teignmouth	9. 1653
64	7. IM	
4. S. G	FAICT DARM	10. Downall
1731	IOhN MARTY	

No. 1 is badly cut.

No. 4 is within a square, 5·5 inches in the side and looped at each angle.

Nos. 6 and 10 are in ordinary *written* characters.

No. 7 is within a rectilinear figure which has not been completed, or has been obliterated towards the right. There has been a considerable recent accretion of Stalagmite, which has probably obliterated a portion of the enclosing figure and some of the letters there; thus MARTY has probably lost a terminal N.

Not far from the centre of the Chamber a considerable boss of Stalagmite rises from the Floor of the same material,

* The numerals prefixed to the inscriptions do not belong to the originals.

having on its sides several badly-scratched letters, and the following very well cut inscription, in characters about an inch high :

ROBERT HEDGES
OF IRELAND
FEB. 20. 1688.

On account of the name on it, this mass of Stalagmite has been named "The Hedges Boss." It can scarcely be necessary to say that the Committee have left it so far intact as they found it. The earlier explorers had broken the Stalagmitic Floor all around it, and they, or probably some still earlier visitors, seem to have contemplated its removal or destruction; for its apex is broken off, and a cylindrical hole 7 inches deep has been bored into it, no doubt with the intention of blasting it. In basal circumference it measures about 30 feet; its present mutilated top is about 4 feet high, and the Floor of Granular Stalagmite from which it rises is about a foot thick. It is not possible to believe that Mr. MacEnery countenanced the attempt to destroy this Boss, as he attached much importance to the inscription on it, mentioning it at least four times. The effort may, no doubt, be ascribed to an earlier period, when it is stated by a writer in the *Monthly Magazine* for June, 1805, twenty years before Mr. MacEnery's first visit, when the Cavern was open to all comers without let or hindrance, that "attempts have been made to work the stones and spars" [in Kent's Hole], "but they do not prove ornamental." (xix. 435. See also *Trans. Devon. Assoc.* x. 142-3.)

It is not a little strange that though the name "Robert Hedges" is perfectly legible, Mr. MacEnery not only never so rendered it, but actually gave it in three distinct forms; twice he spoke of it as "Robert Hodges" (*Trans. Devon. Assoc.* iii. 275, 459), once as John Hodgson (*Ibid.* 314), and once as "J. Hodges" (*Ibid.* 459). Nevertheless, his description of it is of great value. "The letters," he said, "are glazed over and partly effaced." (*Ibid.* 275.) Again, "The letters in the inscription are overlaid." (*Ibid.* 459.) In short, the terms he applied to it are still perfectly apposite, and justify the belief that the inscription is as old as it professes to be. The drip on it at present is somewhat plentiful in wet weather, and there is no doubt that calcareous matter is still in course of precipitation on it. Of all the characters, the terminal 8 in the date is probably most in danger of obliteration.

It was stated in the Tenth Report that the exploration of

the Cave of Inscriptions had been completed up to 16 feet from its Entrance, when, the mouth of Clinnick's Gallery being completely exposed, the investigation of the deposits in the latter portion of the Cavern was undertaken. (See p. 362 above.) This, as already mentioned, was carried on until December 1st, 1874, when the work in the Cave of Inscriptions was resumed.

In that portion of this Cave, explored in 1874, the Committee found that there were no traces of the presence of their predecessors; that the Granular Stalagmitic Floor was everywhere intact and continuous, and the Crystalline Stalagmite lay beneath it; that the latter had been broken by some natural agency, and though in some cases the severed portions remained *in situ*, in others they had been removed and were not always traceable; and that adjacent to the left wall of the Cave a wedge-like layer of Cave-earth lay in its proper place between the Stalagmites, and was 6 inches thick at the wall but thinned out at about a yard from it, beyond which the one Stalagmitic Floor lay immediately on the other. (See p. 362 above.) This continued to be the case to a large extent for the next 18 feet (that is, up to 34 feet from the Entrance), the only exception being that the broken blocks of Crystalline Stalagmite were never dislodged beyond being occasionally "faulted" to the extent of 2 or 3 inches. At and beyond 34 feet from the Entrance traces of the earlier explorers were again met with in almost every part of the Cave, but were found to be limited to the breaking up of the Stalagmites and of the subjacent deposit to the depth of 12 inches at most. A thin layer of Cave-earth extended throughout the entire Cave; and it was obvious that at the time when its deposition commenced the Crystalline Stalagmite did not exist as a continuous sheet, for in considerable spaces the Cave-earth lay immediately on the Breccia without any Stalagmite between them. Though it was not always easy in these cases to determine the exact junction of the two deposits, there was no doubt that the upper surface of the Breccia was very uneven when the Cave-earth began to be lodged on it. On the discovery of objects of interest at or near this doubtfully-defined junction, care was taken to record them as belonging to the "Cave-earth and Breccia" (meaning thereby the *junction*, not a *mixture*, of the two), even though, from their own characters, it was usually easy to refer the objects to their proper deposits and eras respectively. Large blocks of Limestone, some of them requiring to be blasted, were numerous in this Cave, both in the Stalagmites and below them.

On its excavation being completed, the Cave of Inscriptions was found to extend upwards of 60 feet from north-east to south-west, 45 feet from south-east to north-west, and to be upwards of 20 feet high. In the right or northern wall, immediately before reaching the Hedges Boss, there is a recess to which the name of "The Alcove" has been given; another, in the north-western corner, may lead to an External Entrance to the Cavern; in the south-west corner is the mouth of the long tunnel known as the "Great Oven;" and adjacent to it is a narrow aperture or slit about 3 feet wide at the entrance and extending to an unknown distance, but too narrow for exploration beyond a length of 7 feet.

Two "finds" only were met with in the Granular Stalagmitic Floor. One (No. 6491) consisted of a few bones, including a portion of a large humerus; the other (No. 6495) was a very small bone, probably of Bat, with bits of charcoal and of coprolite, all lodged in the same hand specimen of Stalagmite, and found 3rd December, 1875.

The Cave-earth yielded 4 teeth of *Hyæna*, a few gnawed bones, coprolites on several occasions, and 1 Flint flake (No. 6520).

At and near the junction of the Cave-earth and Breccia, where they were not separated by Stalagmite, 2 right lower jaws and 4 loose teeth of *Hyæna*, 38 teeth of Bear, part of a jaw of Fox, 1 incisor tooth of a small Rodent, numerous bones and fragments of bone, a somewhat large number of coprolites, and 1 Flint flake were met with. At least, most of the Ursine remains may be safely referred to the Breccia, while all those of the *Hyæna* undoubtedly belonged to the Cave-earth. One of the *Hyæna* jaws just mentioned (No. 6570) contained all its teeth except the inner incisor; but, as was commonly the case with lower jaws in the Cave-earth, had lost its lower border and articulating end, and was much gnawed. It was found 14th May, 1875, with a loose canine tooth also of *Hyæna spelæa*, 4 teeth of Bear, and a few fragments of bone.

The other jaw of *Hyæna* (No. 6577) had lost the 2 inner incisor teeth and the condyle, was slightly gnawed, but otherwise entire. It was found 24th May, with a loose tooth of *Hyæna*, one of Bear, and a fragment of bone.

The Flint flake (No. 6582), found 1st June, 1875, belonged probably to the Breccia, but was of but little importance.

There were found in the Breccia, 82 teeth of Bear, some of them in jaws or parts of jaws; 2 of Lion in a portion of right upper jaw, numerous bones and pieces of bone, including part of a skull and several other good specimens; and 13 Implements, flakes, and chips of Flint and Chert.

The Lion's teeth (No. 6518) were the last two molars. The sockets of the canine tooth and the small first false molar betokened an animal of great size. (See pp. 373, 4 above.) This interesting specimen was found 31st December, 1874, with 2 teeth of Bear, bones and fragments of bone in the second Foot-level of Breccia.

A few only of the Flint and Chert specimens require description.

No. 6550, made of a well-rolled Chert nodule, was an Implement somewhat semi-lunar in form, broader at one end than the other, 4·4 inches long, 2·3 inches in greatest width, and 2·5 inches in greatest thickness, which it attained near the broader end. It had undergone a considerable amount of chipping, had been reduced to an irregular edge along the greater part of its perimeter, and was comparatively thin at the narrower end. It was very, but unequally, convex on both faces each of which had a central ridge, and retained the original surface of the nodule over the whole of the but-end, whence a trace of it extended along the central ridge of the less convex face to about an inch from the opposite end. The chipped portion of the surface had a yellowish hue, derived, no doubt, from the matrix in which the specimen lay, and which is apparently superficial only. This fine Implement was found 15th February, 1875, near the Hedges Boss, 36 feet from the Entrance of this Cave, without any object of interest near it, in the first Foot-level of Breccia, having over it one foot of Cave-earth.

No. 6565, a Chert Implement, 3·7 inches long, 2·7 inches in greatest breadth, and 1·7 inch in greatest thickness which it attained not far from its centre, had unfortunately lost one of its extremities, apparently broken off while the tool was being made. It was very, perhaps equally, convex on each face, but the centres of convexity were not opposite each other; and though obviously made from a nodule, not a flake, no part of the original surface remained. A considerable amount of work had been expended on it, it had been reduced to an edge all round the circumference except the broken end, but this edge was neither keen nor regular, nor in one uniform plane. It was met with 13th April, 1875, in the second Foot-level of the Breccia, 47 feet from the

Entrance of the Cave of Inscriptions, without any object of interest near it. Its colour was whiter than that of most of the Breccia tools, in which respect, as well as in its shape and in the absence of any trace of the original surface it closely resembled the implement No. 6103, found in the Long Arcade, 7th May, 1873. (See p. 346 above.)

No. 6581, a Flint flake struck from a rolled nodule, was round at one end, abruptly truncated at the other, reduced to an edge along both lateral margins, 2·2 inches long, 1·6 inch in greatest width, and ·6 inch in greatest thickness. The inner surface was very irregular, the outer had three longitudinal facets, the lateral margins were sharp but slightly jagged as if from use, both ends were blunt, and the "but" retained the original surface of the nodule. Its colour was the warm yellow so prevalent in the specimens found in the Breccia, but there were indications of the interior being white. It was met with 29th May, 1875, in the second Foot-level of the Breccia, 57 feet from the Entrance of the Cave of Inscriptions.

The Narrow Aperture or Slit in the south-west corner of the Cave of Inscriptions, already mentioned, was so contracted as to render it impossible to excavate the deposits occupying it in Parallels, Levels, or Yards. The specimens found in it, however, were only 2 teeth of Bear, a few pieces of bone, and a coprolite.

The earlier explorers had, as usual with them, imperfectly examined the material they dug up in the Cave of Inscriptions, and then thrown it on one side. On taking it to the daylight the Committee found in it 19 teeth of Bear, 12 of Fox (of which 10 occupied portions of three lower jaws), 9 of Hyæna (two of them being in part of a lower jaw), 2 of Horse, and 1 of Rhinoceros, and a large number of bones (some entire but most of them fragmentary), numerous coprolites, a fragment of a marine shell, and 6 flakes and chips of Flint.

The exploration of the Cave of Inscriptions was completed on 14th June, 1875, having occupied the labour of between 8 and 9 months.

The following is a list of the specimens found in it in undisturbed ground, inclusive of those mentioned in the Tenth Report (See pp. 363-5 above):—

In the Granular Stalagmitic Floor: 1 Bone of Bat (?), a few bones, a few patches of coprolite, and a bit of charcoal.

In the Cave-earth: 27 teeth of Hyæna, several of them in

jaws or parts of jaws; 11 of Bear; 1 of a small rodent; 1 jaw of Fox; numerous bones and fragments of bones, of which 6 had been charred and still more had been gnawed; a large number of "finds" of coprolite; and 7 Tools, flakes, and chips of Flint and Chert.

In the Breccia: 321 teeth of Bear, some of them in jaws and parts of jaws; 2 of Lion in parts of an upper jaw; and 20 Implements and flakes of Flint and Chert.

The Recess, or High-level Chamber:—On completing the exploration of the Cave of Inscriptions, operations were at once commenced in the Recess occupying its north-western corner, which was expected to lead to a new External Entrance to the Cavern. The following were the grounds on which this expectation was founded:—At the Entrances of the Cavern at present known, on the eastern face of the Cavern hill, and termed the Triangular and the Arched Entrances, the Cave-earth was at a high level and of great depth. Thence it sloped rapidly in all directions open to it, and at the same time decreased in depth, until reaching the remote end of the Lecture Hall towards the south and the bottom of the Sloping Chamber towards the west. From these facts it was concluded that the Cave-earth entered the Cavern through the two well-known high-level Entrances. Beyond the foot of the slopes just mentioned the levels were no longer governed by the Cave-earth but by the Breccia—the underlying more ancient deposit; and there was in each case an acclivity, instead of a declivity, on proceeding farther and farther into the Cavern—comparatively short and abrupt from the Lecture Hall to the Water Gallery in the Eastern Division of the Cavern, but long and gentle from the Sloping Chamber to the Recess, now under notice, in the Western Division. These acclivities indicated apparently that the Breccia entered the Cavern not, like the Cave-earth, through the Entrances on the eastern side of the hill, but through an opening, or openings, on the western side; and the same facts pointed out the Recess in the north-western corner of the Cave of Inscriptions as more likely than any other part of the Cavern to lead to such openings. So far as they could be studied, moreover, its own characters supported the hypothesis. The Recess extended in a north-westerly direction, and for a distance of 60 feet was sufficiently wide for a man to pass easily, but beyond that distance it was too narrow for examination. Its Floor, a thick sheet of the Crystalline Stalagmite, was abruptly truncated at the junction of the Recess with the Cave of Inscriptions, thus bearing a

close resemblance to that in The Gallery opening out of the Great Chamber described in the Second Report. (See pp. 206-8, above.) Finally, the deposit on which the Floor rested was undoubted Breccia, occupying a higher level than elsewhere in the Cavern.

The exploration of the Recess was begun on 15th June, 1875; and, it being decided to leave intact the Stalagmitic Floor just mentioned, in fact to burrow under it, the successive Parallels were necessarily cut 5 feet deep, instead of the usual 4 feet, in order to give the men sufficient height for working. During the progress of the work a hole was bored through the Floor overhead, when it was found to consist entirely of pure Stalagmite 18 inches thick. When the excavation had reached a distance of 10 feet the Recess had become so narrow as to render it necessary to abandon the work, or to break up the Floor and proceed at a higher level. The former course being, though reluctantly, decided on, the work there was suspended on 6th July, 1875. The only objects of interest found in the Recess were 2 teeth of Bear, 3 "finds" of bones, and an unimportant piece of Flint (No. 6590).

[The exploration of this branch of the Cavern was subsequently resumed, and the name "High-level Chamber" was substituted for "Recess." (See the Fourteenth Report, below.)]

The Alcove.—The exploration of the Alcove or recess near the Hedges Boss in the Cave of Inscriptions, already mentioned, was begun on 7th July, 1875, and finished on 26th of the same month, or at the end of about 3 weeks. When emptied, it proved to be scarcely lofty enough, from Limestone floor to Limestone roof, for an ordinary man to stand erect, to measure about 10 feet both from north to south and from east to west, to be divided into two Compartments—a Northern and a Southern—by a Limestone partition extending almost completely across it, and to have two Entrances from the Cave of Inscriptions. The earlier explorers had partially ransacked the Northern Compartment, but had not entered the Southern, in which a Floor of Stalagmite almost reached the roof. Beneath this Floor, and without any trace of Cave-earth, lay the Breccia, never exceeding 3 feet in depth, and resting on the Limestone floor.

Thirty-nine "finds" of remains of Mammals were met with in the Alcove, including 59 teeth of Bear (several of them in portions of jaws), 16 of Fox (all in portions of three lower jaws), 4 of Hyæna, numerous bones (including several good specimens, though all of them were more or less frag-

mentary), and 1 coprolite. The teeth of Hyæna, 2 of the jaws of Fox, and the coprolite were met with at the junction of the Northern Compartment and the Cave of Inscriptions, amongst fallen masses of Limestone, where neither the character of the deposits nor the exact position of the specimens could be determined. The remaining jaw of Fox, however (No. 6619), was found in the Breccia; it was broken into two pieces, which lay together, and contained 5 teeth. This specimen was found 17th July, 1875, at the inner or eastern end of the Southern Compartment, in the second Foot-level of the Breccia, with remains of Bear. It may not be out of place to remark that remains of the Common Fox (*Canis vulpes*) have been identified among the Mammalian relics from the Forest-bed underlying the Boulder-clay on the coasts of Norfolk and Suffolk. (See Boyd Dawkins's *Cave Hunting*, p. 418.)

In proportion to the volume of the deposit it contained, the Alcove was far richer in osseous remains than any part of the Cave of Inscriptions, of which it is an adjunct. It is worthy of mention, perhaps, that it contained no trace of Flint or Chert.

The Great Oven.—The passage or tunnel opening out of the south-west corner of the Cave of Inscriptions is very long and narrow, and so low that a considerable portion of it can only be traversed on all-fours or in a crouching posture. It connects the Cave of Inscriptions with the Bears' Den, which the Committee have not yet explored, and has been termed the "Oven," partly from its very contracted breadth and height, but mainly because a vertical section of a considerable part of it, at right angles to its length, closely resembles that of the small earthenware ovens much used formerly in at least the two south-western counties. It has received the epithet "Great" to distinguish it from a similar but still more contracted tunnel in another part of the Cavern, and known as the "Little Oven." (See p. 336 above.)

The excavation of the Great Oven was begun 27th July, 1875, and at the end of that month, beyond which this Report does not extend, it had been completed to 4 feet from its Entrance. Like the Cave of Inscriptions, it contained a thin layer of Cave-earth, with Breccia beneath it of unknown depth. Two "finds" were met with in the Cave-earth, containing 1 tooth of Hyæna and a few bones; and 9 in the Breccia, including 6 teeth of Bear and several pieces of bone.

On studying the osseous remains found by the Committee in the Breccia in the various portions of the Cavern explored during the last twelve months, the following prominent facts arrested attention:—Some of the teeth of Bear were those of very old animals, and worn almost to the fang, such as Nos. 6618 from the first Foot-level, 6597 and 6608 from the second Foot-level, and No. 6611 from the fourth Foot-level, all found in the Southern Compartment of the Alcove during July, 1875. The jaws, though frequently broken, had never lost their lower borders, as was almost uniformly the case with the Cave-earth specimens; and none of the bones had been gnawed. In no instance were the bones found lying in their anatomical relations, but different parts of the skeleton were often confusedly huddled together; thus in No. 6613, found in the second Foot-level of the Breccia, in the Southern Compartment of the Alcove, 15th July, 1875, a canine tooth adhered to one side of the proximal end of a tibia, and a piece of jaw to another side. Some of the specimens had fretted surfaces, and appeared to have been rolled by running water; this was notably the case with Nos. 6608 and 6615, found in the second and first Foot-levels of the Breccia in the Southern Compartment of the Alcove, on 12th and 16th July, 1875, respectively. Many of the bones were broken where they were finally lodged, and the parts, with little or no displacement, reunited with Stalagmitic infiltration; as, for example, Nos. 6615 and 6618, found in the first Foot-level of Breccia in the branch of the Cavern just named, 17th July, 1875. Others appeared to have been flattened and more or less crushed where they lay, of which there was a striking example in the distal end of a left femur (No. 6530), found in the first Foot-level of Breccia in the Cave of Inscriptions, 34 feet from its Entrance, 12th January, 1875. Occasionally the same rock-like mass of Breccia contained bones of very different colours; thus No. 6603 contained portions of two bones not half an inch apart, each accidentally broken across; and while one was of a creamy whiteness throughout, the other was a very dark brown, approaching to black. It was found in the second Foot-level of Breccia in the Alcove, 9th July, 1875. This specimen, by no means unique, showed that contemporary bones lying side by side may be of very different colours.

Nor were the remains met with in the Cave-earth void of instruction. Wherever Cave-earth was met with, there also were found traces of the Hyæna, either in the form of parts

of his skeleton, or his coprolites, or bones scored with his teeth-marks, or jaws divested of their lower borders, or long bones broken after his well-known and recognizable fashion. But though everywhere present in greater or less numbers, these traces became less and less plentiful with increased distance from the External Entrances to the Cavern, and were very few and far between in the Cave of Inscriptions—the Chamber most remote from the Entrances. While the remains of the Hyæna were thus met with wherever Cave-earth occurred, they were in the interior accompanied by those of very few of his contemporaries. Thus, while the Chambers adjacent to the Entrances contained teeth and bones of Horse, Rhinoceros, Deer (several species), Bear, Fox, Elephant, Ox, Lion, Wolf(?), and Hare, as well as Hyæna (the latter being far the most prevalent), remains of Hyæna alone were found during the last twelve months in the Cave-earth. Nor was it without interest to note the portions of the Cavern in which remains of the different forms just enumerated were last detected on the way to the Cave of Inscriptions. The Hare was not found anywhere in the Western Division of the Cavern—that of which the Cave of Inscriptions is the innermost Chamber; the Badger, Wolf, and Ox were represented in the Charcoal Cave, but not beyond it; and relics of Horse, Rhinoceros, Deer, Bear, Fox, Elephant, and Lion, did not appear beyond the Long Arcade.

Finally, no traces of *Machairodus* were met with after the incisor tooth found 29th July, 1872, and described in the Eighth Report. (See p. 333 above.)

TWELFTH REPORT. Read at Glasgow, September, 1876. (See *Rep. Brit. Assoc.* 1876, pp. 1–8.)

Though the Committee have still the satisfaction of stating that they retain the valuable services of George Smerdon, foreman of the work, they have to add that Nicholas Luscombe, who had been engaged a short time before the Eleventh Report was drawn, was obliged to leave very soon afterwards on account of illness, and that there was some difficulty in supplying his place, there being a great demand for labourers at Torquay at the time. At the beginning of September, however, they engaged a young man named William Matthews, who has given complete satisfaction, and is still at work in the Cavern.

The Great Oven, continued.—The Committee stated in their last Report that on the 27th of July, 1875, they began the

exploration of the small passage or tunnel known as The Great Oven, which connects with one another The Cave of Inscriptions and The Bears' Den. The Great Oven may be said to consist of three Reaches, the Eastern, Central, and Western, all of them, and especially the Central, being very contracted in height and width. The Western Reach (the only one which has been explored) extends tortuously, from its commencement in the south-west corner of the Cave of Inscriptions towards E.S.E. for a distance of 58 feet, where it is succeeded by the Central Reach, and throws off two branches, one in a northerly and the other in a southerly direction. At its junction with the Cave of Inscriptions, it is 8 feet high from the Limestone roof to the bottom of the usual four-feet excavation made by the Committee. Its width is commonly about 4 feet; but at one point it contracts to 3, and at another expands to 7 feet. Throughout its entire length, and especially at and near the Entrance, the roof and walls have the aspect of a well-worn watercourse. A few small lateral ramifications open out of the walls, almost all of them being quite empty and well worn by the action of flowing water. How far they extend cannot be determined, as they are too narrow for investigation.

In this Western Reach of the Great Oven there was no continuous Floor of Stalagmite, though here and there portions of such a Floor adhered to and projected from the walls; and pieces of Stalagmite, as well as detached Paps of the same material, occurred in the deposit below. There was no reason to suppose that earlier explorers had ever worked in this part of the Cavern.

As in the adjacent chambers and galleries, the deposits consisted of a thin layer of Cave-earth above and Breccia below; and throughout the Reach the one lay immediately on the other, without any intermediate Crystalline Stalagmite such as occurs in typical sections. At the Entrance, and up to 34 feet from it, the usual four-feet sections failed to reach the bottom of the Breccia, so that its depth was undetermined; but at the point just named, the Limestone Floor was found at a depth of 3.5 feet below the upper surface of the Cave-earth; and thence to the inner end of the Reach the Floor was found everywhere at a depth of 4 feet at most, and frequently at but little more than 2 feet, thus displaying a continuous Limestone Floor for a length of 24 feet—a fact without a parallel at present in the history of the exploration. At the innermost end the height of the Reach was 8.5 feet, from Limestone Roof to Limestone Floor. The upper surface

of the Cave-earth was an irregularly inclined plane, ascending 8 feet from the Entrance inwards, or rising at a mean gradient of about 1 in 7; while the Limestone Floor was inclined in the same direction at a higher mean gradient and with still greater irregularity.

The discoveries in this portion of the Cavern were neither numerous nor important. The total number of "finds," including the few mentioned in the Eleventh Report (see p. 384 above), amounted to 50. The remains found in the Cave-earth included 2 teeth of *Hyæna*, 6 of Bear, 10 of Ox, 1 plate of a small molar of Mammoth, several bones and pieces of bone, including an astragalus of Horse, a few coprolites of *Hyæna*, a portion of a Flint flake (No. 6672), and a Flint chip. (No. 6661.)

The Flint flake (No. 6672) was of a pretty uniform cream-colour, almost a parallelogram in outline, 1·4 inch long, ·7 inch broad, abruptly terminated at each end one of which retained the original surface of the nodule from which it was struck, and ·3 inch in greatest thickness, which it attained near the but-end. The inner face was slightly concave; the outer very convex and consisted of three planes or facets, the central one commencing near the but-end, while those on each side of it extended the entire length of the flake. Its ridges and (excepting a very few small notches) its lateral edges were quite sharp, and showed that it could have had little or no wear and tear in any way, and that in all probability it reached the spot in which it was found, not by the transporting action of water, but by Human agency; in short, that Man intentionally took it to, or accidentally left it in, one of the branches of the Cavern most remote from the known External Entrances. It occurred with chips of bone, within a foot of the upper surface of the Cave-earth, 40 feet within the mouth of the Great Oven, on 13th October, 1875.

The specimens found in the Breccia were 8 teeth of Bear and a few bones, none of which call for special description.

Besides the foregoing, there were 2 teeth of Bear and some bones and pieces of bone found at and near the junction of the two deposits, where, there being no separating Stalagmite, it was not easy to determine whether they belonged to the Cave-earth or to the Breccia, without trusting entirely to the specimens themselves.

The Central or most contracted Reach, that from which the Great Oven more especially took its name, was a perfectly

empty tunnel, of elliptical transverse section, about 2·75 feet high and 3·25 feet wide, with roof and walls and floor so strikingly smooth as to denote a well-worn and completely filled watercourse, extending through the Limestone in an easterly direction for a distance of 20 feet, where it was succeeded by the Eastern Reach, which finally terminated in the Bears' Den, whence its exploration can alone be undertaken.

The two branches which the Western Reach threw off at its inner end, one on each side of the Central Reach, were filled with deposits from roof to floor; but as they were, at least at their Entrances, very contracted in both height and breadth, as the deposits they contained formed a most intractable concrete, and as the specimens found in their vicinity were comparatively few and unimportant, the Superintendents closed their attempts to explore them, and left the Great Oven on 27th October, 1875, having spent about three months on it.

The Labyrinth.—Three branches of the Cavern, known as The Charcoal Cave, Underhay's Gallery, and The Labyrinth, open out of the left or eastern wall of The Long Arcade, described in previous Reports. The first two have been explored and reported on (see pp. 322–330, 356–360 above); but the Committee had undertaken no researches in the Labyrinth—the southernmost and most important of them, when the Eleventh Report was presented. When Mr. MacEnery and his contemporaries commenced their labours in the Cavern, the existence of this chamber was probably known to but very few persons, as what appeared to be its *two* Entrances must have been so nearly filled with deposits of different kinds as to reduce them to the size of mere pigeon-holes; and it is perhaps worthy of remark, by way of confirmation, that though it contained large and lofty bosses of Stalagmite such as visitors loved to enrich with their names or initials, the only inscription found in it was dated many years after the commencement of Mr. MacEnery's researches.

The Entrance to the Labyrinth is about 190 feet from that of the Long Arcade, and 280 feet from the nearest External Entrance to the Cavern. The name of *Labyrinth* appears to have been given to it on account of the difficulty which, without a guide, visitors experienced in threading their way between the numerous fallen masses of Limestone and the large bosses of Stalagmite which occupied its Floor. In fact,

it was not only the most bewildering part of the Cavern, but even persons somewhat familiar with the scene so constantly "lost their bearings" as to be unable, even after emerging from it, to tell whether their way out of the Cavern lay to the right hand or to the left. "There was," says Mr. Mac Enery, "a tradition of the loss of life here by a young man who ventured to explore it without a guide. It is certain that two gentlemen, who lost their light and way spent a night of horror here, dreading to advance for fear of falling into the pits . . . they remained immovable until their friends came to their relief, alarmed by their absence." (*Trans. Devon. Assoc.* iii. 238.)

In another passage, speaking of the Labyrinth as "The Zigzag Route," he says, "Of the dangerous intricacies of this section of the Cavern a memorable and nearly fatal illustration occurred during the American War. Some officers of the fleet then stationed in Torbay had the hardihood to attempt to explore it without a guide. Having lost their clue, they wandered about in the vain hope of retracing their steps, during which their torches were burnt out. They then groped about in different directions and separated. After a night of horror they were released by their friends, who, alarmed at their absence, recollected the projected adventure and hastened to their deliverance." (*Ibid.* 460.)

The Labyrinth extends from the Long Arcade, in a south-easterly direction, for about 46 feet, throwing off three narrow branches at and near its inner end. Of these, the central one, opening out of the south-eastern corner, and which it is proposed to call "Matthews's Passage," after one of the workmen, leads into the Bears' Den; another, the mouth of which is immediately adjacent and opens out of the north-eastern wall, has long been famous as "The Little Oven," and has its other end on the mass of limestone known as "The Bridge" (see p. 336 above), at a distance of upwards of 60 feet towards the north; while the third, commencing in the southernmost corner, extends for a distance of at least from 15 to 20 feet towards the south-west. The Labyrinth is commonly from 17 to 18 feet wide, but expands at one point to 22, and contracts at another to 15 feet; its greatest height is 18 feet, measured from the bottom of the excavation.

The walls and roof, though by no means without traces of the erosive action of flowing water, are in most places extremely rugged, and suggest by their fretted aspect that even the last of the numerous blocks of Limestone encumbering its floor must have fallen a long time ago.

The Labyrinth is separated from the Long Arcade by a massive curtain of Limestone descending from the roof to the depth of 9 feet across a space about 18 feet wide, being, so to speak, slightly looped up at each end to form two small Entrances. Observers unaccustomed to caverns are not unlikely to speculate on the cause which prevents the fall of this mass, and to hasten on lest the time before the event occurs may be undesirably brief.

Mr. Mac Enery had conducted some diggings in the Labyrinth, and had carried them to a depth of at least three feet at one of the Entrances, so that by assuming a stooping posture ingress and egress became possible. In all other parts his work was much less deep, and, on account of the state of the floor, was necessarily discontinuous.

Omitting the large blocks of Limestone, the deposits were:—First, or uppermost, a Floor of Granular Stalagmite, from which there arose several huge bosses also of Stalagmite, one of which was 11 feet high above the floor, while its base occupied a rudely circular space fully 15 feet in mean diameter.

Second, a layer of Cave-earth, rarely amounting to more than a foot in depth, and sometimes to not more than a few inches, while it occasionally reached as much as 2 feet.

Third. Though it may be doubted whether there ever was a *Floor* of the Crystalline Stalagmite in the Labyrinth, the lower, and by far the greater, part of the bosses mentioned above was of that variety, and was covered with a comparatively thin envelope of the Granular kind, without any mechanical deposit between them.

Fourth, the Breccia lay immediately beneath the Cave-earth, there being nothing to separate the two, and extended to a depth exceeding that to which the excavations were carried.

In looking at the facts as they presented themselves, day after day, the following appeared to be not improbably the history of the deposits in this part of the Cavern:—

During, as well as after, the deposition of the Breccia with its Ursine relics, Stalagmite, having now a Crystalline texture, was in course of precipitation, and in such a way as to form, not *sheets* or *floors*, but *bosses* of a more or less conical form, which, while they rested on Breccia, had their lower slopes covered with the same material, so that their bases were deeply buried in that ancient deposit.

After the close of the era of the Breccia, the precipitation was still carried on, but, as before, in such a way as to add to the volume of the *bosses*, and not to produce a *floor*.

Then came the deposition of the Cave-earth, with remains of Bear, Lion, Fox, Hyæna, Mammoth, Rhinoceros, Horse, Ox, and Bird—all of them, with the exception of the first three, unknown in the Breccia.

Later still was the precipitation of that Stalagmite which is Granular instead of Crystalline, and which not only added to the dimensions of the already massive bosses, but flowed out in sheets and covered the Cave-earth.

While all these successive operations were in progress, blocks of Limestone fell from time to time from the roof—some of them being buried in the Breccia at depths the excavators have not reached, some lying loose on the Floor of Granular Stalagmite, and others occupying all intermediate zones, and representing the intervening periods.

In order to achieve the thorough exploration of the Labyrinth, it was necessary to break up all the bosses of Stalagmite with the exception of the largest of them, of which a portion has been left intact, it being believed that it shows strikingly the utter inadequacy of the data derived from a *Boss* to solve the problem of the amount of time represented by a *Floor*, and *vice versa*. Before directing the workmen, however, to remove any of these Stalagmitic accumulations, the Superintendents carefully examined them for inscriptions. Nevertheless, one inscription was overlooked—that already referred to as the only specimen of the kind within the Labyrinth; and it was not until a portion of the largest boss was blasted off that it was found to have on it "G. Knight, June 1st, 1836." (See p. 389.)

The upper surface of both the Cave-earth and the Breccia rose, with some irregularities, 38 inches from the Entrance of the Labyrinth to its innermost extremity, giving a mean ascending gradient of 1 in 17.

The total number of "finds" in this part of the Cavern was 135, and the specimens they included were as follow:—

Lying on the surface.—Three portions of ribs and two other bones (No. 6780), the two latter having been cut with a sharp tool, perhaps by an existing butcher, and one bone of Bat in a heap of "Pipes" of Stalactite probably collected by man.

In the Granular Stalagmite.—One tooth of Lion.

In the Cave-earth.—32 teeth of Hyæna, 7 of Bear, 6 of Fox, 3 of Horse, 2 of Rhinoceros, 3 plates of a molar tooth of a young Mammoth, 1 of Lion, 1 of Ox, and 1 of Sheep (of doubtful position), several bones and portions of bone,

including a tarsus of Bird, and two pieces of bone apparently charred, 1 coprolite, and 1 small chip of Flint.

In the Crystalline Stalagmite.—6 teeth of Bear, of which 5 were in one and the same jaw.

In the Breccia.—215 teeth of Bear, and a considerable number of bones, many of which were good specimens.

As in all other parts of the Cavern where he had made researches, Mr. Mac Enery simply cast aside the material he dug up, without taking it to the exterior for final examination. The Superintendents took outside the Cavern the "broken ground" met with in the Labyrinth and examined it carefully in daylight, as in all previous cases of the kind. It yielded 17 teeth of Bear, 14 of Hyæna (three of them in pieces of jaws), 2 of *Megaceros hibernicus* (in part of a jaw), 1 of Deer, 1 of Horse, 1 of Sheep; bones and pieces of bone; and part of a Crab's claw, no doubt quite recent.

The exploration of the Labyrinth, commenced on October 28th, 1875, was completed on July 10th, 1876, upwards of 8 months having been spent on it.

Matthews's Passage.—Having finished their researches in the Labyrinth, the Committee proceeded at once to explore the small passage leading from it to the Bears' Den, and termed, as already stated, Matthews's Passage, thus leaving the two other and adjacent small ramifications to be undertaken on some future occasion, if at all. To this course they were tempted partly on account of the wealth of osseous remains which, from Mr. Mac Enery's description, they were likely to find in the Bears' Den.

Matthews's Passage consisted of two Reaches: the first, opening out of the Labyrinth, extended towards the south-east for about 14 feet, where the second turned sharply towards east-north-east, and after a somewhat tortuous course for about 15 feet entered the Bears' Den. Their height was from 9 to 10 feet almost everywhere (measuring, as usual, from the bottom of the excavation, which nowhere reached the Limestone floor), and they varied from 3·5 feet to 7 feet in width. The walls and roof, the latter especially, bore evident traces of the erosive action of a flowing stream, succeeded by the corrosion due, no doubt, to acidulated water, the surfaces being much fretted. Holes, having the aspect of mouths of small water-courses, opened out of the walls and roof in various places; and about midway in the Second Reach the roof rose into a small water-worn dome, from the apex of which a cylindrical flue

ascended into the Limestone, and, like the watercourses just mentioned, was quite empty.

There were but scanty traces of a Stalagmitic Floor in the First Reach, in which, however, the earlier explorers had here and there broken ground; but throughout the entire length of the Second Reach a Floor of Granular Stalagmite extended from wall to wall, varying from 10 to 24 inches in thickness; and at about 10 feet from its Entrance there was also a portion of a Floor of Crystalline Stalagmite adhering to the left wall, whence it probably never extended to the opposite side. It was about 15 inches thick, below and almost in contact with the Granular Stalagmitic Floor, but separated from it by a layer of Cave-earth about one inch thick.

The mechanical deposits in the First Reach were a thin layer of Cave-earth above, and the Breccia of unknown depth below; but in the Second Reach the space beneath the Stalagmitic Floor was mainly occupied with large loose masses of Limestone, some of which required to be blasted more than once in order to remove them. The spaces between them were filled with Cave-earth or Breccia, with comparatively few specimens of any kind.

The upper surface of the Cave-earth was almost perfectly horizontal in the First Reach; but in the Second there was a gradual and total ascent of 27 inches, giving a mean gradient of about 1 in 7 for that Reach.

Matthews's Passage yielded a total of 49 "finds," consisting of specimens which may be thus distributed:—

In the Cave-earth.—26 teeth of Hyæna (some of them in portions of jaws), 2 of Bear, 1 of an immature Mammoth, 1 of Fox, and a considerable number of bones, many of them being more or less broken and a few of them gnawed.

In the Breccia.—100 teeth of Bear and a large number of bones, including many good specimens. The richest "finds" were met with in a small narrow recess in the outer angle at the junction of the two Reaches, where the teeth and bones lay confusedly huddled together, suggesting that flowing water had probably carried them to the spot they occupied.

No trace of man was detected in any part of this branch of the Cavern.

The exploration of Matthews's Passage, begun on 11th July, 1876, was completed on 31st August, having occupied about 7 weeks; and operations were commenced in the Bears' Den on 1st September.

In looking over the work accomplished, and the discoveries made, since the Eleventh Report was presented, the following noteworthy facts presented themselves:—

1st. In their Eleventh Report the Committee sketched the distribution in the Cavern of the remains of the various species of Mammals which characterized the Cave-earth. Of this sketch the following is a brief summary:—The Hyæna had been met with wherever the Cave-earth was found; the Hare had not been detected anywhere in the Western Division of the Cavern—that most remote from the External Entrances; the Badger, Wolf, and Ox had not been found beyond the Charcoal Cave; and relics of Horse, Rhinoceros, Deer, Fox, Elephant, and Lion had not appeared beyond the Long Arcade. (See p. 386 above.)

The discoveries which have since been made require that this sketch should be corrected in the following particulars:—Remains of Ox, Horse, Rhinoceros, Deer (?), Fox, Elephant, and Lion have all now been found beyond the Long Arcade, in one or more of the three branches of the Cavern explored during the last twelve months. In all other particulars the distribution remains at present as sketched in 1875.

2nd. No tooth, or, so far as is known, other trace of *Machairodus latidens* has been met with since the last Report was drawn. In short, the only evidence of the presence in the Cavern of this extinct species of Mammal which the Committee have detected during the continuous labour of almost twelve years, is the solitary, but well-marked, incisor found 29th July, 1872.

3rd. As has been already stated, the Committee commenced the exploration of the Labyrinth on 28th October, 1875, and from that time to 31st August, 1876 (a period of upwards of ten months), they were occupied in it and in Matthews's Passage, both of which they completely explored; yet, during all that time, and in those two important portions of the Cavern, they found no trace whatever of Prehistoric Man. Had the Committee, on receiving their appointment from the British Association in 1864, commenced their researches in either of the parts of the Cavern just named, instead of beginning at one of the External Entrances of the Cavern, and proceeding thence steadily through the successive chambers and galleries, there can be little or no doubt that Kent's Hole would have been pronounced to be utterly destitute of any evidence on the question of Human Antiquity, and but poorly furnished with the remains of extinct Mammalia. The work would probably have been

closed without going farther, to the great loss of Anthropology and Palæontology, as well as of popular education in these important branches of science.

THIRTEENTH REPORT. Read at Plymouth, August, 1877. (See *Rep. Brit. Assoc.* 1877, pp. 1-8.)

The Bears' Den.—The Chamber termed The Bears' Den by the Rev. J. Mac Enery measures about 67 feet in length from north to south nearly, from 8 to 38 feet in width, and from 8 to 15 feet in height, the last dimension being measured, as everywhere else in the Cavern, from the bottom of the excavation. The Limestone roof is extremely rugged, fretted, and waterworn. The Lake (see p. 254 above) opens out of the north-eastern corner of the Den, and nearly opposite, in the western wall, is the eastern mouth of the Great Oven. (See pp. 384, 386 above.) On the same side as, and immediately south of, the latter opening is a vast boss of Stalagmite, which the Superintendents of the work have preserved intact.

This boss is crowded with inscriptions, most of which are unfortunately difficult to decipher, partly because they cross one another, and also because they are much scratched, apparently by the nailed shoes of visitors. The following, however, have been distinctly made out:—

1. "William Petre, 1571." 2. "A. T., 1662."
3. "I. Bertie, 1706" (in a rude segment of a circle, of which the chord is 8·5 inches, and the height 5·5 inches).
4. "I. R., 1706" (in a rectangular figure, 2 × 1·5 inches).
5. "A Chard, 1817." 7. "W. Crew."
6. "R. D., 1822." 8. "S. Crocker."
9. "F. Davy." (In letters 6 inches high, produced apparently with a series of blows with a pointed hammer. The last letter is Y by inference only. Its place is occupied by a triangle placed thus—▽, formed by the complete removal of a thin lamina of the Stalagmite. This removal was probably accidental, and caused with the unintentional effect of the blows of the hammer in the attempt to form the Y.)
10. "Anton Hay."
11. "Dauid More" (in engrossed letters).
12. "John Skinner."
13. "F. D." (within a heart-shaped figure, measuring 5·5 inches from the indent to the point opposite, and 5 inches in greatest breadth).
14. "W. R." 15. "W. E."

There is also a date belonging to the second decade of the 17th century, but to what precise year cannot be determined,

as the right or units numeral is not decipherable. All that can be made out is "161" [?].

No. 1 is of considerable interest on two accounts :—

First. The date, 1571, is, so far as is at present known, the earliest in the Cavern, and the only one belonging to the 16th century.

Second. Its genuineness can scarcely be doubted, as it is known that there were living at the period in question two natives of South Devon named William Petre—Sir William Petre, the statesman, who obtained the manor of Brent, near Totnes, at the dissolution of Buckfast Abbey, about 1553; and William Petre, his nephew.

Mr. R. Dymond, F.S.A., of Exeter, writing to the Secretary on the question, says :—"Sir Wm. Petre, the statesman, does not appear to have maintained much connexion with Devonshire after attaining manhood; and as the date of the inscription in Kent's Cavern (1571) was that of the year preceding his interment in Essex, it would seem unlikely that it referred to him.

"On the other hand, there is much that points to the conclusion that it was the work of William Petre, his nephew, who owned Hays in St. Thomas, a suburb of Exeter, but who was described as of Tor Newton, and was buried at Tor Brian, near Totnes, in 1614. His mother was a Ridgway of Tormohun, the parish in which the Cavern is situate; and his wife was a Southcote of Bovey Tracey, South Devon. Thomas Ridgway, the then owner of the land which contains Kent's Hole, was the trustee of his marriage settlement in 1585. He probably held frequent intercourse with these connexions, and was familiar with the objects of interest on their property. His monumental inscription (see Prince's *Worthies of Devon*, p. 633) does not state his age, but he died in 1614. His marriage settlement was apparently a postnuptial one; and he was probably young in 1571, when the youthful freak of carving the name in Stalagmite was perpetrated.

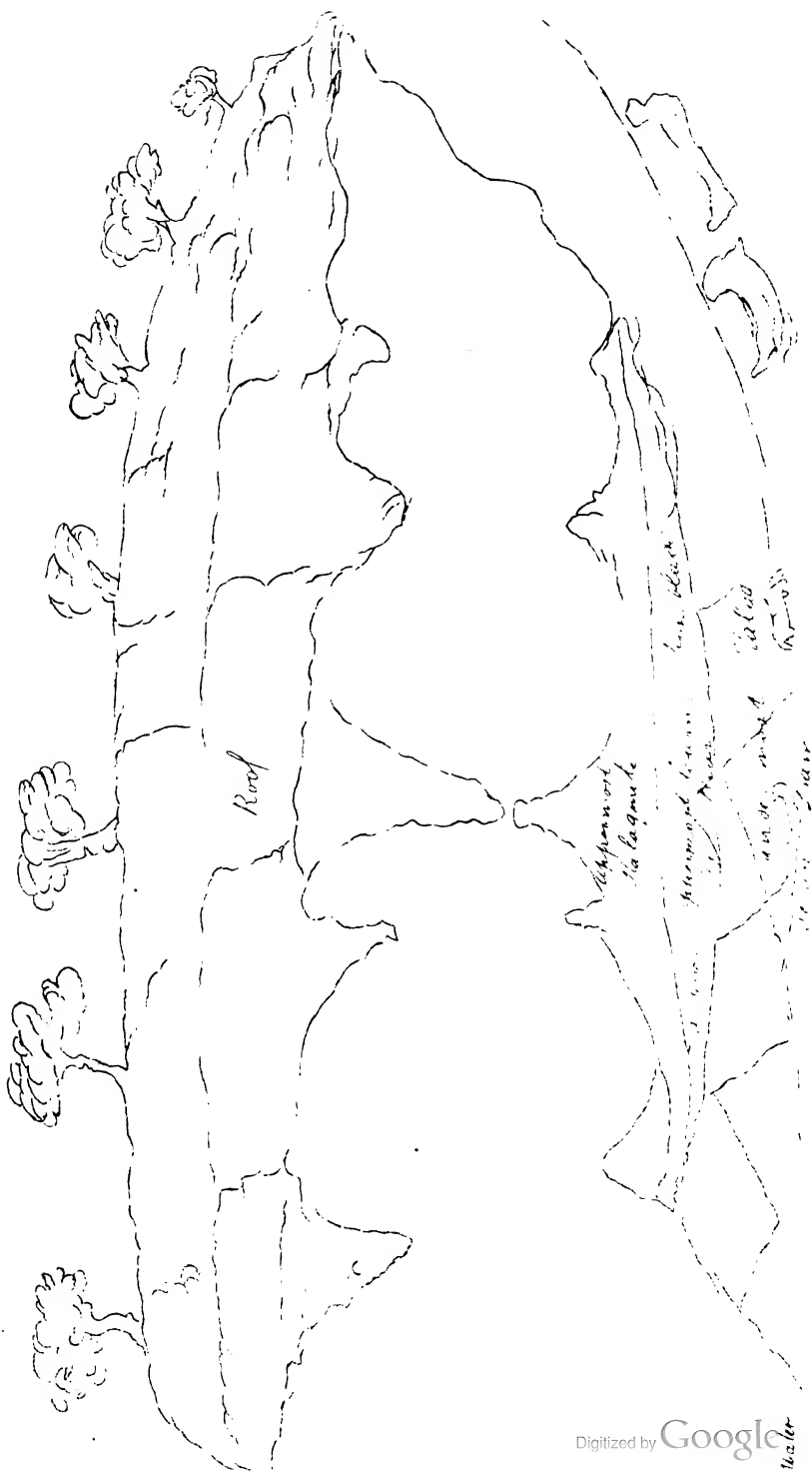
"May we not fairly conclude that he was identical with the 'William Petre' of the Cavern?—R.D., 20th May, 1877."

It may not be out of place to add here that Mr. J. T. White, while preparing his *History of Torquay* (1878), discovered a lease dated December 22nd, 1659, and appertaining to "closes, ffields, or pieces of ground" forming part of the property in which the Cavern is situate, in which occur the words "one close called Kent's Hole;" thus showing that in the middle of the 17th century the Cavern was so well known as to have given a name, in a legal instrument, to a

portion of the estate, and rendering it eminently probable that the inscription of 1571, and all those of subsequent date, may be taken as genuine.

As Mr. Mac Enery broke ground in every part of the Bears' Den, the condition in which he found it can only be learned from the description he has left, and which may be given in the following very condensed form :—"The Floor of the Bears' Den was studded with conical mounds of Stalagmite, supporting corresponding pendants from the roof. Fallen masses of Limestone were strewn about, and some of them were incorporated in the crust. An irregular sheet of Stalagmite, about a foot thick, overspread the Floor, and was based on a shallow bed of indurated rubble, containing tubes of Stalactite collected in heaps in particular places, a great abundance of *album græcum*, an unusual proportion of Bears' teeth, and an iron blade much corroded. Points of Stalagmitic cones were observed to protrude upwards into the rubbly bed, and were found to rise from a lower sheet of Stalagmite. The cones of this lower sheet were precisely under those of the upper, denoting that they were successively deposited from the same tubes above; but the lowermost set exceeded by double the thickness of the uppermost, and the depth of the Stalagmitic sheet was in the same proportion. The lower sheet extended over the entire area of the den; but the superincumbent bed of rubble, and its overlying thin sheet of Stalagmite, disappeared gradually or 'thinned out' towards the sides. The removal of these partial beds displayed the entire surface of the lower sheet, which exhibited a most singular appearance. Over the whole area it was cracked into large slabs resembling flags in a pavement. The upper sheet was not in the least fractured. The average thickness of the cracked sheet was about two feet. It possessed the hardness of rock, and, but for its division into insulated flags, it would have been almost impossible to pierce it. Powder made no impression on it.

"The first flag we turned over displayed a curious spectacle. Skulls and bones of Bear, crowded together, adhered to its under surface. Flag after flag disclosed the same phenomenon; but in one place numerous skeletons lay heaped on each other; the entire vertebral column and its various other bones, even to the phalanges and claws, were discovered lying in their natural relation in a state of preservation as if belonging to the same individual. The remains of Bear prevailed here to the exclusion of all other animals. Some of the



teeth were of the most dazzling enamel, and the bones of their natural fresh colour. Others, on the contrary, were of a darkish brown; even the enamel was of a greenish tinge. Owing to the induration of their earthy envelope, or their incrustation by Stalagmite, few were extracted entire. Two skulls were buried in the Stalagmite as in a mould, and were brought away in that state. In no case were the remains broken or gnawed by the jaws of Carnivores. The long bones were generally found entire, and when observed broken it was only mechanically from pressure. The bones were highly mineralized, heavy, brittle, easy of fracture, and when struck rang like metallic substances." (See *Trans. Devon. Assoc.* iii. 238-40, 272-4, and 307-16.)

"The annexed section," says Mr. Mac Enery, "will indicate the relative arrangement or position of the alternating strata of stalagmite and loam." (*Ibid.* p. 311.) It must not be supposed, however, that the section makes any thing like an approach to accuracy of scale or proportions.

The portions of the Stalagmitic Floor which Mr. Mac Enery had failed to break up, chiefly adjacent to the walls and other confines of the Bears' Den, were sufficient to furnish the Committee with two good examples of the remarkably cracked condition of which he spoke. One of these was in the north-east corner, where a crack about half an inch wide extended from wall to wall, dividing the Bears' Den from the Lake area, passing quite through the Stalagmite—nowhere less than 2 feet thick—but without "faulting" it in the slightest degree, or, so far as could be observed, in any way affecting the underlying deposits. Mr. Mac Enery, however, stated, though somewhat obscurely, that in some instances a derangement had taken place in the materials covered by the broken Stalagmite. (*Ibid.* p. 309.) The second existing crack varied from .25 inch to 2.5 inches wide, and passed completely through the boss of Stalagmite already mentioned—both the Granular and Crystalline portions alike—but without faulting it. It is, perhaps, worthy of remark that there was no unoccupied space between the base of this boss and the deposit beneath it. The two were in direct and undisturbed contact. No such cracks appear to be mentioned by Mr. Mac Enery as occurring elsewhere, nor have the Committee met with any thing of the kind in any other portion of the Cavern.

The ground broken by Mr. MacEnery extended to a depth of from 8 to 20 inches over almost the entire area of the Bears' Den. As was his wont, he left the excavated materials almost where he found them, and, as in all previous cases of the kind, there were amongst them numerous specimens which had been overlooked or neglected. These, carefully collected by the Committee, were kept apart from the relics they found in the deposits below his diggings, and, when the exploration of the Den was completed, such was their number and volume that a horse and cart were required for their removal from the Cavern. They included 1 tooth of Horse, 1 of Fox, 2 teeth of Deer, 4 of Hyæna, 4 of Mammoth, upwards of 200 of Bear, very numerous bones, especially of the vertebral column and feet, a crowd of broken bones and bone splinters, numerous balls of coprolite, and a few bits of coarse pottery. (See *Trans. Devon. Assoc.* xi. 543-6.)

It cannot be doubted that such cracks as Mr. MacEnery describes, if at all approaching in width to that still existing in the Stalagmitic boss in the Bears' Den, must be a possible, and, indeed, probable source of uncertainty respecting the position and relative chronology of some of the objects found in the underlying deposit, especially if, as he states, this deposit shared in the disturbance; for it must be supposed that portions of the overlying Cave-earth or, as Mr. MacEnery called it, the Rubble-bed, together with teeth, bones, and coprolites, such as he found in it, would pass down through the cracks, and be lodged *on*, and perhaps *in*, the underlying Breccia, and that objects belonging to Mr. MacEnery's own era might find their way down through the Granular Stalagmite, which, notwithstanding his statement to the contrary, was as certainly cracked as that below it, as is distinctly shown by the boss.

In accordance with Mr. MacEnery's description and the foregoing considerations, the deposit the Committee had to excavate was the Breccia, with a small amount of Cave-earth lying on it here and there. Fallen blocks of Limestone were extremely numerous; many of them were of great size, and required to be blasted before they could be removed; while others, still larger, penetrated the Breccia below the depth to which the excavation was carried, and were allowed to remain undisturbed.

The excavation in the Bears' Den was limited, as in most other parts of the Cavern, to a depth of four feet below the bottom of the Stalagmite, and a Limestone Floor was nowhere reached.

The "finds" in the Den were 216 in number, of which 12 were in the Stalagmite, 101 in the first or uppermost Foot-level of the underlying deposits, 47 in the second, 32 in the third, 23 in the fourth or lowest, and 1 in a small Recess in the north-west corner of the Den where no attempt was made to define the exact position of the objects. Omitting those found in the Stalagmite and the Recess, 32 of the "finds" were in Cave-earth, 65 at or near the junction of the Cave-earth and Breccia, and 96 in the Breccia, while the matrix of the remaining 10 must be regarded as uncertain. The colour and other characters of the specimens, however, indicated with tolerable certainty to what beds and eras they belonged.

Besides a considerable number of bones and pieces of bone representing numerous parts of the skeleton, the specimens included upwards of 620 teeth of Bear, 24 of Hyæna, 10 of Horse, 7 of Fox, 5 of Mammoth, 4 of Lion, and 1 of Dog (?) or Wolf (?). There were also 20 "finds" of coprolite, and 11 Flints.

Amongst the bones, the skull of a Bear may be mentioned, which, to quote the language of Mr. MacEnery, was "buried in the stalagmite as in a mould, and was brought away in that state." (*Trans. Devon. Assoc.* iii. 239.) Many of the specimens were of considerable interest, but, perhaps, none of them differed so much from those mentioned in previous Reports as to require detailed description. There was, however, a portion of a large canine tooth, probably of Bear, which was noteworthy as having been apparently chipped artificially. From its colour and general characters, it belonged to the Breccia, or oldest known deposit; but it was met with, as part of "find" (No. 6993), in the Cave-earth, with two teeth of Hyæna and a coprolitic ball, on 9th of June, 1877. Specimens similar in character, and found under corresponding conditions, had been previously met with in the Cavern, and were first pointed out by Professor Boyd Dawkins, a member of the Committee, in 1869. (See p. 271 above.)

None of the Flints found in the Bears' Den were of so much interest as many of those exhumed in other parts of the Cavern, and described in previous Reports. The following, however, deserve more than a passing notice:—

No. 6895 was a small, delicately-proportioned, white, flake Tool, 1·75 inch long, ·6 inch in greatest width which it retained for about two-thirds of its length, and ·2 inch in greatest thickness. Both its ends were blunt, its edges sharp, the inner face almost flat, but the outer strongly ridged. It

was found in the first Foot-level, with 6 teeth of Bear and 1 of Mammoth, on 1st November, 1876, and was undoubtedly a true Cave-earth Implement.

No. 6929 was an irregular rolled Flint nodule, from which two flakes had been dislodged after it ceased to be exposed to any action capable of scratching its facets or injuring its edges. It was about 2·5 inches long, 1·4 inch in greatest breadth, 1·1 inch in greatest thickness, and found, without any object of interest near it, in the Breccia, in the fourth Foot-level, on 17th November, 1876. It had the dark, manganic smutty surface which occasionally characterized the Breccia Tools.

No. 6943 was a white flake Implement, 2·2 inches long, ·5 inch in greatest breadth, and ·3 inch in greatest thickness; was broadest at one end, whence it gradually tapered towards the other, but was somewhat scimitar-shaped, and had lost its point. It was nearly flat on one face, strongly ridged on the other whence three longitudinal flakes had been dislodged, and its lateral margins were thin and sharp. It was found on 28th November, 1876, in the Cave-earth, in the first Foot-level, with relics of Bear, Elephant, and Hyæna.

No. 6986, a white flake, 1 inch long, ·6 inch wide, and ·2 inch in greatest thickness, was a parallelogram in outline, slightly convex on the inner face, doubly ridged on the outer; quite thin at the lateral margins one of them being somewhat notched, thick at each end, and in all probability the central portion of a Tool of greater length. It was found with 4 Teeth of Bear, 1 of Hyæna, and pieces of bone, on 30th December, 1876, in the first Foot-level, and belonged to the Cave-earth series.

No. 6997, a cherty Flint Nodule-implement, 3·2 inches long, 2·5 inches in greatest breadth, and 1·8 inch in greatest thickness, may be described as a somewhat sharply-pointed, rudely heart-shaped Tool, retaining some of its original surface as a rolled nodule. It was found on 10th January, 1877, in the second Foot-level, in the Breccia, without any object of interest near it.

No. 7040, a very rough specimen, 2·75 inches long, 1·6 inch in greatest breadth, and ·95 inch in greatest thickness, retained remnants of the original surface of the nodule, and was found in the Breccia, in the first Foot-level, without any object of interest near it, on 5th March, 1877.

No. 7059, 2 inches long, 1·1 inch in greatest breadth, and ·6 inch in greatest thickness, was irregularly convex on each face, pointed at one end and rounded at the other, and

retained traces of the original surface of the nodule. It was found in the Breccia, in the second Foot-level, without any object of interest near it, on 15th March, 1877.

A column or pillar of Stalagmite was met with on 14th November, 1876, adjacent to the east wall of the Bears' Den, and about 22 feet from its northern end, under the following peculiar circumstances:—It measured about 51 inches in basal circumference and 3·75 feet in height. The base was of nondescript outline, but everywhere above it the pillar was rudely elliptical in horizontal section, and it measured 30 inches in girth at the height of 2 feet, where it was least.

When found, however, it was in two parts, having been divided along an almost horizontal plane where it was thinnest. Each of the segments stood perfectly erect, but not one on the other; for though the bottom of the upper segment was on precisely the same level as the top of the lower, the upper portion had been moved towards the right, or west, to the extent of 15 inches horizontally, and stood there on the Breccia. In other words, the pillar had been "faulted," so to speak, about 5 inches more than its diameter. It cannot be doubted that when the dislocation occurred the pillar had reached its full height, and the Breccia had accumulated round it to the height of 2 feet—that is, it had reached the level of the plane of fracture. It is difficult to see how, by any possibility, the deposit could at that time have reached a greater height, and difficult also to understand how anything other than Human hands could have shifted the upper segment of the pillar and placed it so as to preserve its erect position. On the other hand, it is just as difficult to see what motive Man could have had for such a work. The whole pillar, when found, was completely buried in the Breccia, and the top of the upper segment was about a foot below the bottom of the thick remnant of Stalagmitic Floor, which Mr. Mac Enery had left intact, and which contained no cracks of any kind.

The exploration of the Bears' Den was finished on 8th June, 1877. It was begun on 1st September, 1876, and had occupied upwards of nine months.

The Tortuous Gallery.—As soon as the work in the Bears' Den was completed, the exploration of a narrow passage opening out of its southern end, and termed "The Tortuous Gallery," was begun. At and near its entrance this Gallery was from 13 to 15 feet high; but at 11 feet from the Bears'

Den a second, or branch, Gallery presented itself, almost immediately above it, the two being divided by a continuous sheet of Limestone, forming the Floor of the higher and the Ceiling of the lower. The branch extended, with some irregularities of direction, towards the south-east for a distance of 30 feet, where it became too narrow for a man to pass. Immediately beyond this point it was somewhat broader, but its further character and length were unknown. At the entrance, where its dimensions were greatest, it was 7 feet high and 3 feet broad. Throughout its entire accessible length its walls and roof had strongly marked indications of the action of water. With the exception of a few large blocks of Limestone, it was entirely empty.

The principal Gallery—The Tortuous Gallery proper—after throwing off a second and lower branch towards the west, turned sharply towards the east at a distance of 23 feet from the Bears' Den; and at 11 feet farther it expanded into a small Chamber, the Floor of which was a pavement of blocks of Limestone, some of them of considerable size. This Gallery varied from 6 to 8 feet high, and from 1·5 to 4·5 feet wide, and had obviously been a watercourse. Ground had been broken here and there by the earlier explorers up to 11 feet from the Bears' Den. Everywhere farther in there was a continuous unbroken Floor of Stalagmite, from 1·5 to 3·5 feet below the Limestone roof; but at 3 feet beyond the point at which, as already stated, the Gallery turned eastward, an unoccupied interspace was found between the lower surface of this Floor and the top of the underlying deposit. At first this hiatus did not exceed a foot, but as the work progressed it gradually reached 4 feet.

The underlying deposit was exclusively the Breccia. Its upper surface formed a continuous declivity, so great that at the small Chamber previously mentioned the level was 163 inches below that of the nearest part of the Bears' Den—a mean gradient of 1 in 2·5. For the first 9 feet the thickness of the Breccia was not more than from 3 to 3·5 feet, the Limestone Floor being everywhere reached within these limits; but elsewhere the ordinary four-feet sections failed to disclose the Limestone.

The "finds" met with in the Tortuous Gallery up to the end of July, 1877, were but 14 in number, and contained little of importance; 5 of them were met with in the first or uppermost Foot-level (all near the Entrance), 3 in the third, and

6 in the fourth (all but one some distance from the Entrance). They included, besides bones and bone-chips, 12 teeth of Bear, some of them being in portions of jaws, and 1 of Horse. The latter was found on the surface, near the Bears' Den, with 3 bits of coarse, friable, black pottery. A Core of black Flint—in all probability a "strike-light" of the present century—was found under the same conditions, about a foot from them.

On reviewing the work of the last eleven months the Superintendents cannot but express disappointment at not having found the very large number of choice specimens which Mr. Mac Enery's glowing description had led them to expect in the Bears' Den. Nevertheless the discoveries they have made not only justify his description, but show that in that part of the Cavern the osseous remains were almost entirely confined to the uppermost foot of the Breccia, and mainly to its actual surface. So long as the lower levels remained untouched, the belief that they were equally rich would have naturally prevailed; and it cannot be doubted that in disposing of this belief very satisfactory work has been done.

The Committee have again to state that since their last Report was presented they have found no relic of *Machairodus latidens*. It is satisfactory, however, to know that since the last Meeting of the Association the crown of a canine tooth of this species has been found in Robin-Hood Cave, Creswell Crags, Derbyshire. (See *Quar. Journ. Geol. Soc. Lond.* xxxiii. 594.)

FOURTEENTH REPORT. Read at Dublin, August, 1878. (See *Rep. Brit. Assoc.*, 1878, pp. 124–129.)

The Tortuous Gallery, continued.—When their Thirteenth Report was drawn, the Committee were engaged in the exploration of a part of the Cavern opening out of the southern end of the Bears' Den, to which, on account of its form, they had given the name of the "Tortuous Gallery." (See p. 403 above.) This Gallery divided itself into two Reaches, and a small terminal Chamber. The First or outermost Reach extended southwards from the Bears' Den about 23 feet, where it was succeeded by the Second Reach, which, after a course of 11 feet in an easterly direction, reached the terminal Chamber. The Reaches varied from 6 to 8 feet from the roof to the bottom of the excavation, and from 1·5

to 4·5 feet in width—the Second or innermost being the narrower. The upper surface of the deposits they contained inclined inwards, falling 13·5 feet in the 34 feet between the Bears' Den and the Terminal Chamber, or at a mean gradient of 1 in 2·5. In the eastern wall of the First Reach, about 16 feet from its Entrance or northern end, an opening led to a considerable "Undervault," to be subsequently described; and near the junction of the Reaches a small Recess extended southwards about 5 feet. At the end of July, 1877, the two Reaches only had been explored. (See pp. 403–5 above.)

On entering the terminal Chamber, its Floor was found to be a complete pavement of blocks of Limestone, some of them of considerable size. Their removal disclosed an almost horizontal bed of the Breccia, the thickness of which was undetermined. It was excavated to the customary depth of 4 feet but without reaching its base anywhere. The Chamber measured about 30 feet from north to south, from 7 to 13 feet from east to west, and from 8 to 13 feet from the roof to the bottom of the excavation. A narrow slit extended towards S.S.E. from the southern end, but became too contracted for a man to pass beyond 7 feet in that direction. The roof of the Chamber was much fretted, and had several vertical and almost cylindrical cavities, about a foot in diameter as well as in height. The walls were very angular, and presented everywhere so much the appearance of fresh fracture as to suggest that the blocks of Limestone forming the Floor, as already stated, had fallen from them in comparatively recent times.

The only objects of interest found in the Chamber were 1 tooth of Bear and piece of bone, which occurred at depths exceeding a foot, and a lump of oxide of manganese (No. 7092), found in the third Foot-level.

The Recess, near the junction of the two Reaches, previously mentioned, was, in proportion to its capacity, much more productive, as it yielded four "finds" (Nos. 7096–9), including 12 teeth of Bear and several pieces of bone. One of the finds (No. 7098), occurred in the Crystalline Stalagmite, and the others in the Breccia, at depths exceeding a foot.

The exploration of the Tortuous Gallery was closed 30th October, 1877, after having occupied very nearly 5 months. It yielded a total of 23 "finds," of which 14 were described in the Thirteenth Report. (See p. 404 above.) The entire series, from first to last, included 25 teeth of Bear—several of them in pieces of jaws—1 tooth of Horse, several bones

and pieces of bone, 3 bits of coarse friable black pottery, and a piece of black Flint—in all probability a “strike-light” of the present century. The relic of Horse, as well as the potsherds and the strike-light, was found on the surface, and very near the Bears’ Den.

The Undervault.—On the completion of the Tortuous Gallery, the exploration of the branch thrown off towards the west, from its first Reach, as stated above, was at once undertaken. This has been called the “Undervault,” as it was probably the principal “undervaulting” mentioned by Mr. Mac Enery in the following passage (see *Trans. Devon. Assoc.* iii. 307–8):—“In a narrow neck which on the right hand as you enter, issues from the Bears’ Den, you come to a naked floor of rock perforated with numerous shafts or spiracles by which you descend, by the aid of hands and feet, as down a chimney, into a low space. They expand into a low range of undervaultings, extending under the upper cave to a considerable extent, but too low to be accessible to any extent. From the first landing place there is a gradual descent, step by step, into a second and even a third terrace, like so many stories. Broken flags of stalagmite—the debris of the successive formations—were strewed about and partially inserted in the latest crust now actually accumulating. In one place the crust went bodily down entire with the loam it covered; in another it may be seen extending across in the form of a bridge; in more places it was shattered to pieces and reversed.”

The observations made by the Superintendents of the present exploration harmonise well with Mr. Mac Enery’s description just quoted. The deposit found in the Undervault must be regarded as an uncertain mixture of Cave-earth and Breccia, probably washed confusedly together by water descending at intervals to the lower levels. The total number of “finds” met with was 35, of which by far the greater number were not more than 2 feet below the surface. They included 47 teeth of Bear, 33 of Hyæna, and 2 of Fox, numerous bones and fragments of bone, 1 Chert flake, and the greater portion of a large Quartzite pebble. Many of the teeth, of both Bear and Hyæna, were in jaws or portions of jaws.

Amongst noteworthy specimens may be mentioned the right lower jaw of a Hyæna (No. 7101), which contained all the teeth with the exception of two of the incisors—the outer and inner—and was almost perfect, whereas most of the jaws of the Hyænine deposits in Kent’s Hole are more or

less mutilated, having lost the condyles, or the lower border, or both. It was found within a foot of the surface, with 1 tooth of Bear, a vertebra of the same hue as the jaw, and several bone chips, 3rd November, 1877.

No. 7129, also a right lower jaw of Hyæna, and a fine specimen; had lost its condyles and all the incisors, but was otherwise perfect. The teeth, however, had seen more service than those in the jaw previously described. It was found with 4 detached teeth of Hyæna, and several bones, in the second Foot-level, 4th December, 1877.

In striking contrast to the two foregoing specimens was a portion of a left lower jaw of Hyæna (No. 7131), which, whilst it retained all the molar teeth, had lost its condyles and lower border, being thus in a condition much more characteristic of the Cavern. It was found, with 2 teeth of Bear, a canine tooth of Fox, and several bones, in the first Foot-level, 7th December, 1877.

The "find" No. 7234 included part of the left lower jaw of Bear—containing the canine and 2 molar teeth—and a detached tooth of Bear; and was found in the second Foot-level, 11th December, 1877. This was the last "find" met with in the Undervault.

The Chert flake (No. 7102) was of a dark grey colour, had a pentagonal outline, and was in all probability produced artificially. It was found with a canine tooth of Fox and pieces of bone, in the first Foot-level, 3rd November, 1877.

The fragment of a Quartzite pebble mentioned above (No. 7119) was more than half of a well-rounded ellipsoidal mass, and weighed nearly 3 lbs. avoirdupois. It was met with in the second Foot-level, without any object of interest near it, 19th November, 1877; and does not bear any traces of having been used as a "Hammer stone." The exploration of the Undervault ended 17th December, 1877, having occupied about six weeks.

The Great Oven, resumed.—The narrow branch of the Cavern connecting the Cave of Inscriptions with the Bears' Den, by passing from the southern side of the former to the north-western corner of the Den, is known as the Great Oven. It consists of three Reaches—the Western, opening out of the Cave of Inscriptions; the Central; and the Eastern, opening out of the Bears' Den. They are all, and especially the Central Reach, very contracted in both height and width. The Western Reach was explored in 1875 (see pp. 384–9 above), the Central one does not appear to have

ever contained deposits of any kind, and the Eastern Reach occupied the Committee from 18th December, 1877, to 15th February, 1878, or about two months.

At its junction with the Bears' Den, the Eastern Reach had a continuous unfractured Floor of Stalagmite of great thickness, and, with the exception of a thin upper layer, all belonging to the Crystalline variety; while at the southern angle was a boss of the same material fully 5 feet high. Beneath this Floor lay the Breccia; but at 6 feet from the Entrance, and thence onward, Cave-earth presented itself between the two Stalagmites. At first it was found adjacent to the northern wall only, and in a depression in the surface of the Crystalline Stalagmite, but it soon extended itself from wall to wall, and for a few feet the successive sections were in descending order as below:

1. Granular Stalagmite, a few inches thick only.
2. Cave-earth, also but a few inches thick.
3. Crystalline Stalagmite, from 2 to 3 feet thick.
4. Breccia, the base of which was nowhere reached.

At about 10 feet from the entrance the lowest two deposits occupied so narrow a slit that the attempt to excavate them was abandoned; and from that point to the inner end of the Reach, the Granular Stalagmite varied from 6 to 12 inches in thickness, and the Cave-earth from 6 to 24 inches.

The length of this Reach of the Great Oven was 34 feet, and its width varied from 10 feet at the outer, to 3 feet at the inner, end. It may be described as a narrow oblique slit in the Limestone.

It yielded a total of 29 "finds," 2 of them in the Granular Stalagmite, 16 in the Cave-earth, 2 in the Crystalline Stalagmite, and 9 in the Breccia. The animal remains included 36 teeth of Bear—of which 20 were in the Cave-earth, 1 in the Crystalline Stalagmite, and 15 in the Breccia—8 of Hyæna, and 3 of Fox. The only relics found in the Breccia were those of Bear. The presence of the Hyæna in the Cave-earth was also attested by a few coprolites.

The only noteworthy "find," perhaps, was No. 7138, which included an almost perfect left lower jaw of Hyæna, 2 detached teeth of Hyæna; 5 teeth of Bear; a few bones, including a perfect left radius; pieces of bone; and a few coprolites. This "find" was met with in the first Foot-level, in the Cave-earth, 30th January, 1878.

A total of 40 "finds" was met with in the two Reaches of the Great Oven, in 1875 and 1878 together; 2 of them were in the Granular Stalagmite, 18 in the Cave-earth, 2 in the

Crystalline Stalagmite, and 18 in the Breccia. The relics in the Cave-earth included 20 teeth of Bear, 9 of Hyæna, and 3 of Fox, whilst those in the Crystalline Stalagmite and the Breccia included 25 teeth of Bear.

Nothing indicating the presence of Man was detected in any part of the Great Oven.

The High Chamber, resumed:—In their Eleventh Report the Committee stated that on June 15th, 1875, they commenced the exploration of a Recess, opening out of the north-west corner of the Cave of Inscriptions, which it was expected would lead to a new External Entrance to the Cavern; that its Floor, a sheet of Crystalline Stalagmite—abruptly truncated at the junction of the Recess with the Cave of Inscriptions—had been found, by boring, to be 18 inches thick; that this Floor covered and rested on a thick accumulation of Breccia, reaching a higher level than elsewhere in the Cavern so far as was known; that it had been intended to leave the Floor intact, and to burrow under it; that at 10 feet from the entrance the lateral walls were so very nearly together as to render it necessary to abandon the work altogether, or to break up the Floor so as to secure, at a higher level, sufficient space for the operations of the excavators; and that the work had been there reluctantly suspended on 6th July, 1875, after no more than three weeks had been spent on the Recess. (See pp. 382, 3 above.)

The workmen, on completing the Great Oven, were directed to return to the Recess just mentioned, and, in accordance with the conclusion arrived at in 1875 as already stated, to break up the thick Floor of Stalagmite instead of attempting to burrow under it. From that time they have been exclusively occupied there, and at the end of July, 1878, had advanced upwards of 30 feet from the Entrance, and reached a level of about 6 feet above that of the adjacent Cave of Inscriptions. On account of this comparatively high level, the name of the "High Chamber" has been given to the so-called Recess.

From the Entrance up to 25 feet within it, there was a continuous unbroken Floor of Stalagmite from 5 to 6 feet thick, with several large bosses of the same material rising from it; but everywhere beyond, so far as the work has at present advanced, the Floor consisted of large blocks of Limestone fallen from the roof, and extending almost from wall to wall, with Stalagmite in some of the vertical spaces between them.

The Stalagmitic Floor consisted mainly of the Crystalline variety, covered with a thin sheet of the Granular kind. In most cases the two Stalagmites lay one immediately on the other, but a few instances of "pockets," occupied with Cave-earth, were met with between them; and the Breccia was found everywhere beneath, and in contact with the Crystalline Stalagmite. Large fallen blocks of Limestone occurred abundantly in this lowest accumulation, many of them requiring to be blasted before they could be removed; while several others, penetrating into the deposit below the depth to which the excavation was carried, were left undisturbed.

From the time the work was resumed in the High Chamber up to the end of July, 1878, a total of 53 "finds" had been met with, of which 2 occurred in the Granular Stalagmite, 1 in the Cave-earth, and 50 in the Breccia. Of those in the Granular Stalagmite (Nos. 7153 and 7170), the former consisted of three specimens of black, probably charred, bone; while No. 7170 was the greater part of an ulna unfortunately broken by the workman who extracted it. The "find" in the Cave-earth (No. 7193) was a solitary molar tooth of Horse.

The specimens yielded by the Breccia included 89 teeth of Bear many of them in jaws or portions of jaws, pieces of skulls, bones and pieces of bone, one Flint Nodule-tool, two Flint flakes and a Quartzite pebble.

Several of the osseous remains were good specimens, but none of them required detailed description.

The Flint implement (No. 7177) was found, without any object of interest near it, May 16, 1878, in the Breccia, in the fourth or lowest Foot-level. It was about 3·1 inches long, 2·5 inches in greatest breadth, 2·2 inches in greatest thickness, rounded, but by no means smooth, at one end, where the original surface of the nodule remained; and abruptly truncated at the other, where its edge was smooth, almost a plane, and measured 1·6 inch by ·5 inch. The prevalent colour was slightly pink, as was usual with the Breccia Implements; but the truncated edge, already mentioned, was almost white, and suggested that it was, perhaps, fractured by the workman who extracted it. This, however, he asserted was not the case; and, from the frankness which had always characterised him, the assertion was no doubt correct. The Implement was very convex and irregular on each face, whence several flakes had been dislodged. It possessed the rude, massive, unsymmetrical characters which mark the Breccia series of tools.

The Quartzite pebble (No. 7204), a rolled fragment of a

larger one, is an oblique semi-ellipsoid, measuring $3\cdot3 \times 2\cdot2 \times 2\cdot2$ inches, and, though of a form and size suitable for a "Hammer-stone," bears no marks of having been utilised in any way. It was found alone in the Breccia, in the fourth Foot-level, on July 29, 1878.

It is, perhaps, worthy of remark that, while the Breccia in the High Chamber yielded fifty "finds," the *Tools*, forming three of them, were found alone, and, on the whole, occupied a decidedly lower zone than the animal relics. Thus of the 46 osseous "finds," 31 occurred in the first or uppermost Foot-level, 11 in the second, 3 in the third, and 1 in the fourth or lowest, while the 3 *Flints* were found only in the third and fourth Foot-levels.

It is difficult to understand how the *Tools* found their way to a branch so remote from the known Entrances of the Cavern, and occupying so high a level. The problem is apparently insoluble except on the hypothesis that the workmen are approaching an Entrance hitherto unknown; and as this supposition has been forced on the minds of the Superintendents by other and independent facts, they believe it to be most desirable to settle this question if possible, as they do not doubt that it would give a definiteness to the explanation of some of the Cavern phenomena.

FIFTEENTH REPORT. Read at Sheffield, August, 1879. (See *Rep. Brit. Assoc.*, 1879, pp. 140-148.)

Financial.—Since the last Report was presented the following contributions towards the funds for carrying on the work have been handed to the Secretary:—Mr. Gerard Ferrand, £5; Rev. Canon Greenwell, M.A., F.R.S., F.S.A., £1; Mr. T. W. U. Robinson, F.G.S., £1.

The High Chamber, continued.—When the Fourteenth Report was drawn the workmen were engaged in excavating the deposits in a branch of the Cavern termed the High Chamber, into which they had then penetrated about thirty feet from its Entrance, that is, its junction with the Cave of Inscriptions, out of which it opened. (See p. 410 above.) This work was continued without intermission until its completion on January 9th, 1879, when the High Chamber was found to extend in a north-westerly direction for a distance of about 53 feet, to vary in width from 5 to 10 feet, and in height from 14 feet at the outer, to 8 feet at the inner, end, the measurements being made for the width at the top of the mechanical

deposit; and for the height, from the roof to the bottom of the excavation, which did not reach a Limestone bottom.

At its inner or north-western end the High Chamber sent off two Branches, one towards the north the other towards the south. The Northern Branch was excavated for a distance of 12 feet, where, though the end was not reached, the work was abandoned, for the deposit—Breccia, blocks of Limestone, and Crystalline Stalagmite—reached the roof, and was so compact as to bar all further progress, except by the expenditure of a very large amount of time and money. This Branch, varying from 5 to 7 feet wide, may be regarded as a portion of the High Chamber. How far it extends, and whither it leads, are questions for speculation merely.

The exploration of the Southern Branch presented fewer difficulties, and was much more successful. It will be subsequently described under the name of the "Swallow Gallery."

The roof of the High Chamber throughout the first or outermost half of its length showed distinct traces of the long-continued action of running water, but beyond that distance it had an angular and less ancient aspect, due, no doubt, to the comparatively recent fall of the masses of Limestone which occupied the Floor, while at the inner end it was much shivered. Indeed, the workmen had to dislodge one large mass of rock which appeared very insecure and threatened to fall.

The mechanical deposit found in the High Chamber, exclusively Breccia, was covered with the Crystalline Stalagmite over a considerable area (see p. 410 above), but elsewhere it lay immediately beneath the large masses of Limestone already mentioned, or was without covering of any kind. Its upper surface, ascending continuously from the entrance of the Chamber, reached near the inner end a level about 7 feet above that of the Breccia in the adjacent Cave of Inscriptions. From this point it rose, at a comparatively steep gradient, over a series of Limestone terraces or steps, and beneath a well-defined sheet of Stalagmite, until it reached the roof, where the two deposits occupied and completely filled a large "Swallow hole" in the north-western corner of the Chamber.

After the Fourteenth Report was drawn the High Chamber yielded 41 "finds," of which 16 were either lying on the surface without any covering, or were within a foot of it; 4 were in the second Foot-level below the surface; 8 in the third Foot-level; and 13 in the fourth, the lowest excavated. Eight of the "finds" consisted of artificial objects only, whilst the remaining 33 were almost exclusively relics of mammals,

and included 30 teeth of Bear and one of Fox, together with a considerable number of bones and pieces of bone.

At least some of the objects lying on the surface had no claim whatever to antiquity. Thus No. 7214, found September 23rd, 1878, on the exposed surface of the Breccia, where it contained an unusual amount of very fine sand, consisted of a large number of quill-like tubes of Stalactite, and with them a portion of the stem of a clay smoking-pipe. The whole, including the sand on which they lay, had the appearance of having been washed to the spot they occupied, probably during a period of protracted and heavy rains, when the drip from the roof was unusually copious.

Again, on October 22nd, 1878, a one-bladed penknife ("find" 7222) was met with on the unprotected surface of the Breccia, without any object of interest near it.

The presence of these recent articles is in no way surprising, and presents no chronological difficulty, as there was nothing to prevent an adventurous visitor from reaching the spots where they were found; and it cannot be doubted that some such person lost the penknife, and that a smoker threw away a portion of the pipe he had unfortunately broken.

Many of the teeth of Bear occupied jaws or portions of jaws. They were most prevalent in the lowest Foot-level; there being 4 specimens in the first or uppermost Foot-level; 5 in the second; 4 in the third; and 17 in the fourth or lowest. Though many of them were fine specimens, none call for detailed description or special remark. It may suffice to direct attention to No. 7245, met with November 13th, 1878, in the first Foot-level, and consisting of an almost entire right lower jaw of Bear, a portion of a left lower jaw also of Bear, and one bone. The right jaw contained the canine tooth only, and appeared to have been crushed after its deposition. The fragment of left jaw was that of an immature animal, and contained one molar.

The artificial objects met with, in addition to the stem of pipe and the penknife, already mentioned, were flakes and chips of Flint and Chert, of which there were nine:—

No. 7207, found, with one tooth of Bear, in the Breccia, in the fourth Foot-level, August 8th, 1878.

No. 7211, found, with one tooth of Bear and one bone, in the Breccia, in the fourth Foot-level, September 18th, 1878.

No. 7219, found, with one piece of bone, in the Breccia, in the fourth Foot-level, October 5th, 1878.

No. 7220, found alone, in the Breccia, in the fourth Foot-level, October 9th, 1878.

No. 7224, found alone, in the Breccia, in the fourth Foot-level, October 25th, 1878.

No. 7225, found alone, in the Breccia, in the third Foot-level, October 29th, 1878.

No. 7226, found alone, in the Breccia, in the fourth Foot-level, October 30th, 1878.

No. 7232, found alone, in the Breccia, in the third Foot-level, November 9th, 1878.

No. 7256, found alone, in the Breccia, in the fourth Foot-level, January 9th, 1879.

Compared with the numerous fine Implements found, from time to time, in other parts of the Cavern, none of the specimens in the foregoing list were in themselves of much importance or interest. They were all more or less porous, and adhered to the tongue when applied to it.

No. 7211 measured 1·8 inch long and broad, and 0·4 inch in greatest thickness. Its inner face was slightly concave, while the outer, produced by the dislodgment of five flakes, was convex. Its margin, elsewhere rudely curvilinear, was on one side almost a chisel-like edge, but somewhat broken.

No. 7224 was a leaf-shaped flake, bluntly pointed at one end and obliquely truncated at the other. The inner face was saved by the "bulb of percussion" from being quite flat, while the outer had a strong, nearly central, curvilinear ridge. There appeared some indications on its edges of its having been used as a tool, and it had perhaps undergone a slight amount of abrasion. It measured 3·1 inches long, 1·8 inch in greatest breadth, and 0·7 inch in greatest thickness.

No. 7232 was rudely rhombohedral in form. The inner face was slightly concave, and had a "bulb of percussion;" the outer was convex, and formed by the dislodgment of three flakes, leaving as many parallel longitudinal areas, the central one being broad compared with those on each side of it. This specimen may also perhaps have been slightly abraded.

Including those reported last year (see p. 411 above) the "finds" met with in the High Chamber amounted to 94 in number, and contained 119 teeth of Bear, 1 tooth of Horse, 1 of Fox, numerous bones and bone-fragments, 1 Flint nodule tool, 11 flakes and chips of Chert and Flint, and 1 Quartzite pebble.

The Committee remarked last year that the Flint specimens occurred in the third and fourth Foot-levels only. (See p. 412

above.) It will be seen from the list just given that this was also the fact with regard to the similar specimens found afterward. In short, of the 12 specimens of Flint and Chert found from first to last in the High Chamber, none occurred in the first or second Foot-levels, 4 were met with in the third Level, and 8 in the fourth, or lowest Foot-level to which the excavation was carried.

The Swallow Gallery.—The Branch thrown off towards the south from the inner end of the High Chamber, as stated above, had a total length of about 50 feet, and consisted of two Reaches, the first extending southwards about 26 feet, where the Gallery turned sharply eastward, and extended in that direction about 24 feet. The width varied from 10 to 2.5 feet; and the height, from 6 feet, at the Entrance, to 8 feet at the inner end.

Judging from its roof, this Gallery was, during a long period, a tunnel completely filled with running water; and this is confirmed by the character of the walls, on which, however, indications of *corrosion*, subsequent to the *erosion*, are numerous and well-marked.

About 18 feet from the Entrance of the first Reach, a considerable irregularly-cylindrical "Swallow Hole" extended obliquely upwards into the roof, and was quite empty for a height of about 7 feet, above which it was completely filled with typical Breccia and Stalagmite. The Gallery took its name from this hole.

The deposit occupying this Gallery was everywhere the Breccia, having no continuous Stalagmitic covering until within 10 feet of the inner end, and even there its thickness was inconsiderable. The upper surface of the Breccia had a uniform fall amounting to a total of 38 inches from the outer to the inner end of the Gallery, where it plunged rapidly into, and completely filled, a tunnel; and, being mixed with large masses of Limestone, the work in that direction was abandoned on May 24th, 1879, the exploration of the Swallow Gallery having occupied about nineteen weeks.

The Swallow Gallery, the two Reaches included, presented 58 "finds," of which 33 were on the surface of the Breccia, or not more than a foot below it; 14 were in the second Foot-level; 7 in the third; and four in the fourth. In the innermost 6 feet of the second Reach the sections were cut to a depth of 5 feet instead of the customary 4 feet, but nothing was met with in any of the fifth Foot-levels. The "finds,"

consisting of 94 teeth of Bear (many of them in pieces of jaw), 4 of Fox (in 2 pieces of jaw), one of Horse, one of Sheep, a very large quantity of bones (many of them much broken), one Chert nodule, and 3 chips and flakes of Chert and Flint, were almost equally numerous in the two Reaches, but those in the second or inner Reach were comparatively very rich in specimens: thus, while the 28 "finds" in the first Reach contained in all no more than 20 teeth of Bear, a single "find" (No. 7304), in the second Reach, contained also 20 teeth of Bear with bones enough to fill a wheelbarrow; and the 30 "finds" of this Reach yielded a total of 74 teeth of Bear.

The "find" No. 7297, consisting of bones and pieces of bone met with in the second Foot-level, on April 14th, 1879, contained the proximal end of a left tibia, having on it at least five grooves or scores of different depths, and some of them having within them finer scores, parallel to their sides. When inspected with a lens, the surface of the bone showed several finer lines in various directions. As it may be doubted whether the scores were the teeth-marks of any animal, their origin seems problematical.

Here again it may be remarked that several specimens lying on the surface of the Breccia, without covering of any kind, did not certainly or probably all belong to the era of that deposit. Indeed, the tooth of Sheep already mentioned, and a few bones belonging to the same "find" (No. 7261), were not only open to this cautionary remark, but from their aspect and mineral condition belonged, without doubt, to very recent times. The same may probably be said of the tooth of the Horse (No. 7298), which lay also on the unprotected surface.

The specimens of Flint and Chert found in the Swallow Gallery were not entitled to more than a mere enumeration.

No. 7260, a Chert nodule, apparently never utilised in any way, was found alone in the Breccia, in the fourth Foot-level, January 29th, 1879.

No. 7273, a small chip or fragment of Flint, was found alone in the Breccia, in the third Foot-level, February 22nd, 1879.

No. 7275, a small flake of Flint, probably a fragment of a flake Implement, was found on the surface, near a tooth of Bear and pieces of bone, February 24th, 1879.

No. 7301, a small chip of Chert, was found in the Breccia, in the first Foot-level, with three teeth of Bear and numerous bones, April 22nd, 1879.

The Committee, when treating last year of the Flint Implements which had then been found in the High Chamber, remarked: "It is difficult to understand how the Tools found

their way to a branch so remote from the known Entrances of the Cavern, and occupying so high a level. The problem is apparently insoluble except on the hypothesis that the workmen are approaching an Entrance hitherto unknown; and as this supposition has been forced on the minds of the Superintendents by other and independent facts, they believe it to be most desirable to settle this question, if possible, as they do not doubt that it would give a definiteness to the explanation of some of the Cavern phenomena." (See p. 412 above.)

The Superintendents have no doubt that the researches of the last twelve months have converted into an established fact their "hypothesis" of an Entrance, or, more correctly, of *Entrances*, "hitherto unknown." They believe also that the facts prove that the said Entrances—the Swallow holes in the High Chamber and in the Swallow Gallery—were completely closed before the beginning of the Cave-earth era, and have remained so to the present day.

The Entrance in the Swallow Gallery was probably never available as a passage for any living animal; but there can be little doubt that any tolerably agile creature could readily have used that in the north-west corner of the High Chamber. That the roof dividing this branch of the Cavern from the open day is of very inconsiderable thickness is plainly indicated by the Levels, as well as by the distinctness with which all external sounds are heard in that Chamber; and the "series of Limestone terraces or steps," mentioned already as leading up to the Swallow Hole (see p. 413 above), would form convenient steps for a man or any infra-human animal entering or leaving the Cavern.

Clinnick's Gallery, resumed.—The Committee, in their Eleventh Report, remarked: "The comparative paucity of specimens in Clinnick's Gallery induced the Superintendents, on 1st December, 1874, to suspend operations there for, at least, a time. The labour of seven months had been expended on it, during which the exploration had reached 75 feet from the Entrance." (See p. 375 above.)

On May 24, 1879, when, as stated above, they left the Swallow Gallery, the workmen returned to Clinnick's Gallery, the only known portion of the Cavern the exploration of which had not been completed, that is to the depth of four feet below the base of the Stalagmitic Floor.

In wet weather this Gallery surpasses all other branches of the Cavern in the amount of drip from the roof; and this, on June 16, was so very copious, on account of the unusually

heavy rainfall the preceding day, as well as the previous saturated condition of the ground, that the workmen were wet to the skin within two hours after beginning their work.

Rain fell every day during the ten preceding days; the total fall amounted to 3·01 inches, of which ·97 inch fell on the 15th.

Since its resumption, the excavation in Clinnick's Gallery has been steadily carried on, and is still in progress; and at the end of July it had advanced 27 feet beyond the 75 mentioned in the Eleventh Report. The deposit found there after the work was resumed was exclusively the Breccia, the upper surface of which dipped steadily in the direction in which the workmen advanced, and was 25 inches lower at the point reached on July 31, than at that at which the work was resumed in May. It was covered uniformly with Stalagmite varying from 12 to 30 inches thick.

The paucity of specimens mentioned in the Eleventh Report still characterises this Gallery, for though upwards of two months have elapsed since the workmen returned thither, no more than three "finds" have been met with in that time—a small fragment of a Bear's jaw, with a few splinters of teeth (No. 7314), found in the second Foot-level of the Breccia, on May 31, 1879; and two Chert nodule Tools (Nos. 7316 and 7317).

The Chert Tools, however, were of sufficient interest to repay the time and labour spent in exhuming them. No. 7316 was of light drab-coloured granular Chert, covered almost everywhere with a manganic (?) smut, but having a considerable patch of Breccia cemented to it with carbonate of lime. The outline of the Tool was that of a trapezium with the angles rounded. It was 5·8 inches long, 3·1 inches in greatest width, and 2·3 inches in greatest thickness. The but-end was almost square, and measured 1·4 inch by 1·3 inch. The Tool attained its greatest thickness about 2 inches from this end, whence it tapered on each face to an oblique chisel-edge. The condition of the various edges was not inconsistent with the supposition that the tool had been slightly rolled. It was found alone on July 15, 1879, in the third Foot-level of the Breccia.

No. 7317 was unfortunately broken by the workman by whom it was found and dug out, and who, before he saw it, to use his own language, "throw'd the pick into'n." The surface of the fracture had a very white chalk-like aspect, but the application of hydrochloric acid caused no effervescence. Like the preceding Tool, its surface was largely covered with a manganic (?) smut. In form the Tool may be said to be somewhat pear-shaped. It measured 5·6 inches in

length, 3·5 inches in greatest width, and 2·6 inches in greatest thickness, and was found alone on July 25th, 1879, in the second Foot-level of the Breccia, within 2 feet of No. 7316.

It is perhaps noteworthy that the only other Chert tool having, like Nos. 7316 and 7317, a blackened surface, which the Cavern has at present yielded, was the fine specimen, No. 7317, met with also in Clinnick's Gallery, and described in the Committee's Tenth Report. (See p. 368 above.)

Clinnick's Gallery varied from 12 to 4 feet wide and from 7·5 to 11 feet high. It consisted of Three Reaches, of which the first or outermost extended in a northerly direction about 30 feet. The Gallery then turned at right angles and extended westward about 25 feet, where for 30 feet it again, though with some irregularity, took a northerly direction.

About 16 feet up the third or innermost Reach the Secretary, by crawling up a steep sheet of Stalagmite formed on Limestone rocks *in situ* on the western side, and by wriggling vermicularly through a very small aperture at the top, found himself in a Chamber from 10 to 12 feet long and broad, but not quite so high, where he soon came to the conclusion that there was little or no chance of finding anything of interest to the palæontologist or the anthropologist. The walls and roof, however, were hung with a profusion of beautifully white Stalactites, many of them in the form of long, thin, quill-like tubes, whilst others of larger volume assumed various forms, but all of great beauty. From the floor there rose a forest of Stalagmitic "paps," some of them nearly 2 feet high and 10 or 12 inches in circumference, and all promising, were time allowed, to become pillars reaching the roof. By letting himself down over a rocky ledge, about 4 feet high, at the inner or northern end of this Chamber, he entered a second Chamber, about 25 feet long from south to north nearly, and 12 feet wide; where, though Stalactites and Stalagmites were almost as plentiful and as beautiful as in the ante-room he had just left, his attention was rather riveted on the walls and roof, especially the latter, which were rugged, and angular, and shivered. That blocks of Limestone had in great plenty fallen from them, and in times geologically recent, there could not be a doubt, and their aspect was anything but calculated to inspire confidence in their present stability. Nevertheless, judging from the Stalactites depending from the roof, and the paps rising from the floor, there could have been no very recent fall. The floor, telling much the same story as the roof and

walls, was made up of masses of Limestone, generally of no great size, with numerous pitfalls between them.

On its eastern side, the third or innermost Reach of Clinick's Gallery opens into a large chamber [known as the Rocky Chamber], which the workmen have just begun to explore.

Palæontographical Society.—In 1878 the Committee had the pleasure of receiving from Professor A. Leith Adams, F.R.S., an application for permission to have drawings taken of any relics of Mammoth they had found in the Cavern, for the purpose of illustrating the monograph on the "British Fossil Elephants" which he was preparing for the Palæontographical Society of Great Britain. It must be unnecessary to add that the permission was at once granted, and that such specimens as he wished were forwarded to him without delay.

Professor Leith Adams has accordingly, in Part II. of his monograph (1879), directed attention (pp. 84, 85, 86, 91, 92, 94) to fifteen milk-molars found by the Committee in the Cave-earth, and has given natural-size figures of three of them (Nos. 1,063, 5,489, 5,774; see pl. ix., figs. 3 and 4, and pl. xii., fig. 2.)

The principal facts connected with these teeth of Mammoth are set forth in the following Table XX:—

Nos.	When and where Found.			Found with Relics of	Characters.
	Dates.	Parts of the Cavern.	Foot-levels.		
315	June 23, 1865	Great Chamber.	4th	—	Upper third milk-molar.
1059	Dec. 20, 1865	"	"	—	Lower " "
1063	Dec. 21, 1865	"	"	—	Upper second "
1248	Feb. 10, 1866	"	"	—	Lower third "
2135	Feb. 13, 1867	Vestibule . .	"	—	" " "
2677	July 4, 1867	Great Chamber.	2nd	—	" " "
2902	Oct. 18, 1867	Lecture Hall .	3rd	—	Upper fourth "
1111	Oct. 6, 1870	{ Smerdon's Passage }	4th	{ Hyæna, horse, megaceros, rhinoceros }	" " "
1115	Oct. 21, 1870	"	"	Ox . . .	Lower third "
1117	Dec. 24, 1869	North Sallyport	"	{ Hyæna, horse, rhinoceros, lion . . }	Upper " "
1115	Sept. 8, 1870	{ Smerdon's Passage }	1st	{ Hyæna, horse, rhinoceros, badger, deer }	" " "
5489	June 24, 1871	Sloping Chamber	4th	Hyæna . .	Upper fourth "
1771	Dec. 2, 1871	Cave of Rodentia	"	" " . .	Lower first "
5968	July 30, 1872	Long Arcade .	3rd	Bear . . .	Upper third "
6066	Jan. 16, 1873	"	2nd	—	Lower " "

Speaking of the enamel of the molars of the Mammoth, Professor Leith Adams says, "It is remarkably attenuated in teeth from the Arctic regions" (p. 79), and that "all the teeth [of Mammoth] from Kent's Cavern, Devonshire [which he had seen] show the Arctic type and have *thin* enamel." (p. 80.)

Again, he remarks, "The Arctic or typical crown represented by the North-Asiatic and North-American specimens on the one hand, and Kent's Cavern on the other, presents a decided contrast to the molars from Ilford on the Thames, where not only is the enamel thicker, but the teeth themselves are all much smaller. The same character [as to size] obtained in other parts of the skeleton" (p. 81).

The author describes the specimen belonging to the "find" No. 1063, figured in his pl. ix., figs. 3, 3a, 3b, 3c, as "an excellent representative" of the antepenultimate or second milk-molar "of the upper jaw, and probably of the right side." "The tips of the digitations of the four anterior plates being slightly detrited show," he says, "the owner to have been, at all events, not uterine" (p. 85).

Attention was directed in the Eighth Report to the specimen No. 1063 in the foregoing Table. Mr. G. Busk, F.R.S., a member of the Committee, said then, "I consider that it represents the very rare occurrence of a true mm. 1. . . . This is a very curious specimen, and, as regards the elephant, of remarkable interest." (See p. 320 above.) Professor L. Adams adopts Mr. Busk's determination, and adds, "This tooth is one of the smallest milk-molars of any Elephant with which I am acquainted, and is even more diminutive than the first milk-teeth of the Maltese Pigmy Elephants. . . . The tips of one of the digitations show signs of detrition, and the well-formed and consolidated fangs give evidence, at all events, that the animal did not die in the womb. The probability is, therefore, that this very small tooth may be a rare instance of the *pre*-antepenultimate appearing in the lower jaw of the mammoth, its long divergent fangs leading to the belief that it belonged to the mandible" (p. 84).

SIXTEENTH AND CONCLUDING REPORT. Read at Swansea, August, 1880. (See *Rep. Brit. Assoc.*, 1880, pp. 62-68.)

The Rocky Chamber, continued.—The Committee, in their Fifteenth Report, remarked that, "On its eastern side, the third or innermost reach of Clinnick's Gallery opens into a large chamber, which the workmen have just begun to explore." (See p. 421 above.) This portion, known as "The

Rocky Chamber," is 56 feet long, about 28 feet in greatest breadth, and about 13 feet in greatest height, which it attains near the centre. It is ornamented with numerous striking Stalagmites and Stalactites, though less profusely than the two small adjacent chambers described last year. (See p. 420 above.) These have been left intact as far as possible, and will, no doubt, in future render this Chamber the most attractive part of the Cavern to ordinary visitors.

The deposits in the first or western part of the Chamber were the well-known "Breccia," with its characteristic "Crystalline Stalagmite" overlying it immediately. Each of these "thinned out" entirely before the centre of the Chamber was reached, and the bare Limestone floor lay exposed for a distance of 18 feet. Beyond the centre another deposit presented itself, differing in character, not only from the Breccia, but also from the "Cave-earth," being more like the ordinary soil of cultivated ground, than either of them; there is no doubt, however, that it belonged to the Cave-earth era. It was at first but a very thin layer, covered uniformly with a sheet of "Granular Stalagmite," no more than a few inches thick; but, as the work advanced eastward, both the Stalagmite and the deposit it covered became gradually thicker, never, however, attaining a depth of 4 feet, so that the Limestone floor of the Cavern was laid bare in every section.

In the right wall as one entered the Chamber, and about midway in its length, there was a very narrow crevice or slit in the Limestone extending obliquely from the roof to the floor. It contained no mechanical deposit of any kind; but what may be called its lower wall was lined with a thin sheet of Stalagmite.

The exploration of the Rocky Chamber occupied about four months, but the labour was not repaid with the discovery of any specimen of much value. It is satisfactory, however, to have certainly ascertained whether or not the deposits there contained anything of interest. The "finds" met with were only five in number (Nos. 7318 to 7322), and may be briefly described as below:—

No. 7318. Part of the skull of a large Hyæna, and a detached left upper sectorial tooth belonging to the same species, probably the same individual; found in contact with the bottom of the Granular Stalagmitic Floor, 12th September, 1879.

No. 7319. Relics of Hyæna, consisting of the right upper sectorial tooth, the molar immediately in front of it, the

crown of a canine tooth, the three upper left incisors still in part of the jaw, the right outer upper incisor, and a fragment of skull. The whole were found 16th September, 1879, at the bottom of the Granular Stalagmite, and were not improbably portions of the individual represented by the "find" No. 7318, from which they were about two feet distant. No. 7319, however, included a few fragments of bone belonging to some smaller mammal.

No. 7320. A piece of Flint of nondescript form, from which several flakes had been dislodged. It was 2·4 inches long, 1·75 inch in greatest breadth, 1 inch in greatest thickness, not rolled, the edges tolerably sharp, apparently non-utilized, and having a chalky texture. It was found in the fourth Foot-level below the Granular Stalagmite, without any object of interest near it, 26th September, 1879.

No. 7321. Skull of Sheep with 8 teeth and an axis of probably the same individual. Found 27th November, 1879, lying on, but unattached to, the sheet of Stalagmite in the wall-crevice or slit mentioned above.

No. 7322. The two rami of lower jaw of Wolf (?) or Dog (?), found 27th November, 1879, embedded in, but not covered with, the sheet of Stalagmite in the wall-crevice or slit mentioned above. One of them was lying across the other, and together they contained 12 teeth, most of them considerably worn.

Second, that is deeper, Excavation, in the Long Arcade.—When the Committee began the exploration of the Cavern in March, 1865, it was decided to make a first excavation from end to end, limited everywhere to the depth of 4 feet below the bottom of the Stalagmitic Floor; on the completion of this, to begin, at the Entrance where ground was first broken, a second, that is a deeper, excavation, and proceed in the same order as before through the entire Cavern. The first or 4-feet excavation was completed on November 27th, 1879, when the exploration of the Rocky Chamber was finished. Every Chamber, and Gallery, and Recess large enough for a man to work in—several of which had been discovered during the progress of the work—had been thoroughly excavated and explored, and the entire extent and character of the Cavern to the depth just mentioned, was perfectly known to the Superintendents, as well as to the workmen.

Excepting the Rocky Chamber and portions of one or two small narrow branches and recesses, a Limestone Floor had nowhere been reached by the excavators, so that it was im-

possible to say what was the extent and character of the Cavern at lower depths, or what might be the character and contents of the deposits still occupying them.

The Committee had by no means lost sight of the original idea of a second, that is deeper, excavation; nor were they unmindful of the fact that the work would be incomplete without it; but, bearing in mind that the exploration had already absorbed the continuous daily labour of nearly sixteen years, at a cost to the funds of the Association of £1,850—a result greatly in excess of the first rough estimate—they came reluctantly to the conclusion, during the meeting at Sheffield in 1879, that the time had very nearly arrived for closing the work, and that they would apply for but one further grant, and of no more than £50, with the definite statement that it was “for the purpose of *finishing* the exploration.”

Though the Geological Section, to which it was at once communicated, acquiesced in this conclusion, it called forth a strong and general expression of opinion that it was eminently desirable to lay bare the Limestone Floor in at least some important part of the Cavern, as well as to ascertain whether or not the large mass of deposit still unexcavated contained any animal relics or Human industrial remains; and Professor W. C. Williamson, F.R.S., of Owen's College, Manchester, suggested that subscriptions from private sources might not improbably be made so as to carry on the work for at least one additional year; and he expressed the hope that the suggestion would be kept in mind by the members of the Section, so that it might have some practical issue at the meeting of the Association at Swansea in 1880.

As soon as the entire 4-feet excavation was finished, the Superintendents, having a small portion of the £50 grant still in hand, resolved to begin the deeper work, and for that purpose they selected a spot a little within the outer or northern end of “The Long Arcade.” (See pp. 330 above.) This spot had the advantages of being the lowest level reached in the previous excavation, of offering many facilities for carrying on the work, and the workmen would begin at once with the Breccia, or oldest known deposit, in the Cavern—all those of less antiquity having been there already removed. The work was begun on November 28, 1879, the workmen, as in the first excavation, digging their way daily farther and farther into the Cavern.

It having become known that only a very small sum

remained in hand, the following subscriptions from friends at a distance, as well as in the neighbourhood, reached the Secretary from time to time:—

	£	s.	d.		£	s.	d.
Mr. G. W. Baker . . .	1	0	0	Mr. Josiah Marples . . .	0	10	0
„ A. Benas . . .	0	10	0	„ W. Marples . . .	0	5	0
„ B. Benas . . .	0	10	0	„ G. H. Morton . . .	0	10	6
Dr. Campbell Brown . . .	0	10	0	„ C. G. Mott . . .	0	10	0
Mr. I. I. Drysdale . . .	0	10	0	„ W. H. Picton . . .	0	10	0
„ H. Durander . . .	0	10	0	„ D. Radcliffe . . .	0	10	0
Rev. W. Earle . . .	1	1	0	„ I. Roberts (two don.)	6	8	0
Mr. M. Guthrie . . .	0	10	0	„ J. T. Robinson . . .	1	0	0
„ I. W. Hayward . . .	0	10	0	„ J. Samuelson . . .	1	0	0
„ E. Hughes . . .	1	1	0	„ J. Tanner . . .	0	10	0
„ A. R. Hunt . . .	1	1	0	„ Timmins . . .	0	10	0
Mrs. A. Hunt . . .	1	1	0	„ I. C. Thompson . . .	0	10	0
Miss Hunt . . .	1	1	0	„ E. Vivian (Member			
Mr. R. C. Johnson . . .	0	10	6	of the Cavern Committee)	2	2	0
„ W. Jones . . .	5	0	0	„ G. F. Whidborne . . .	1	0	0
„ W. Lavers . . .	5	0	0	Dr. G. F. A. Wilks . . .	5	0	0
„ J. E. Lee (Member of				A Member of Torquay			
the Cavern Committee)	8	8	0	Natural History Society	1	0	0
„ R. Lowndes . . .	1	1	0	Total . . .	£51	10	0
Captain Mackenzie . . .	5	0	0				
Mr. John Marples . . .	0	10	0				

The Committee take this opportunity to thank all the donors, and to express their sense of special obligation to Mr. Isaac Roberts, F.G.S., not only for his handsome donations, but for kindly interesting his friends in the work, as well as for receiving and transmitting their subscriptions.

The workmen were directed to carry the second, that is the lower, excavation to a depth of five feet below the bottom of the four-feet excavation, making a total depth of nine feet below the bottom of the Granular Stalagmitic Floor. The method of excavating employed from the first was still continued, the deposit being taken out in Foot-parallels and Foot-levels (see p. 196 above); a total length of 132 feet was excavated, in the first three of which a continuous Limestone floor was laid bare; beyond that it ceased, the Limestone walls, instead of meeting actually, were separated by a longitudinal fissure varying from six inches to four feet, and averaging 1·75 foot in the first forty-five feet, but occasionally somewhat wider elsewhere. Throughout the greater part of the excavation a Limestone floor, though not actually, was practically, reached, the fissure being too narrow for the men to work. In this feature, as well as in some others, the Long Arcade closely resembled the two principal galleries of Windmill Hill Cavern, at Brixham, on the opposite shore of Torbay. (See *Phil. Trans.* clxiii. 485; or *Trans. Devon. Assoc.* vi. 798.)

The deposit, with the exception of one or two small "pockets" of Cave-earth, was everywhere the well-known Breccia. Stones rather larger than usual were, perhaps, somewhat more than commonly prevalent in the lowest levels; but it still remained the fact that, so far as at present known, the Breccia is the oldest deposit found in the Cavern. Pieces of Stalagmitic Floor, necessarily of still greater antiquity, presented themselves occasionally in the Breccia—a fact which had been frequently observed during the four-foot excavation—without any trace of the unbroken Floor whence they were derived being detected.

On 19th June, 1880, the Committee, having spent all the money placed at their disposal by the General Committee or the Association, as well as by their private friends, were under the necessity of closing the work and discharging the workmen. Nearly seven months had been spent on the second or lower excavation, and though no more than 18 "finds" (Nos. 7323 to 7340) had been met with, the following description of them will show that the expenditure of time and money had not been in vain.

No. 7323. A Flint "nodule tool" the but-end rudely an inequilateral quadrilateral, about 2·6 inches by 2·3 inches, and almost quite flat. When standing on this as a base, the tool may be described as an oblique triangular pyramid, its axis being at an oblique angle to the base. It attained its greatest girth about 1·5 inch above the base, where it measured 9·7 inches. The faces of the pyramid were by no means planes, and no two of them were of the same width. Their common vertex was a rather blunt edge about ·9 inch long, and their greatest width 3·4 inches, 3·3 inches, and 1·5 inch. The extreme length of the tool was 5·9 inches. Portions of the original surface of the nodule remained almost everywhere around the but-end, and one face was completely covered with it except a space within 1·5 inch of the vertex, whence one flake had been dislodged. It was found alone, in the Breccia, in the eighth Foot-level, December 11th, 1879.

No. 7324. Two Flint specimens (Nos. 7324¹; 7324²).—No. 7324¹ was a nodule tool, almost white, and having no remnant of the original surface of the nodule. In outline it was rudely quadrilateral, about 2·1 inches long, the breadth at the ends being 1·2 inch and 1·1 inch; its greatest thickness was about ·7 inch, which it attained near the broader end. One face had a tendency to flatness, the other was convex, and had one principal longitudinal ridge, and two or three minor

ones. No. 7324 was a chip of but little interest. The "find" occurred in the Breccia, in the fifth Foot-level, where it was met with January 5th, 1880.

No. 7325. A left last upper molar of Bear, a few pieces of bone, and a small Flint chip; found in the Breccia, in the seventh Foot-level, January 15th, 1880.

No. 7326. A considerable portion of a rather large tibia, the distal end perfect, but the proximal end gone entirely. Found alone in the Breccia, in the seventh Foot-level, January 20th, 1880.

No. 7327. Crown of a tooth of Rhinoceros, found alone, in a "pocket" of Cave-earth, January 21st, 1880.

No. 7328. A Flint nodule-tool, 5·8 inches long, 2·7 inches in greatest width, and 1·7 inch in greatest thickness—the maximum width and thickness being about two inches from the but-end. It was very convex on one face, slightly so on the other, and had a small patch of the original crust of the nodule at the but-end. The opposite end was round-pointed, and not more than ·2 inch thick. The tool was found alone, February 11, 1880, in the Breccia, in the eighth Foot-level. This specimen was peculiarly interesting, on account of a remarkably well-developed "bulb of percussion" in one of the lateral edges, about two inches from the but-end.

No. 7329. A Flint chip, not quite an inch long, found alone, in the Breccia, in the ninth Foot-level, on February 13th, 1880.

No. 7330. Piece of bone, found alone, in the Breccia, in the seventh Foot-level, on February 27th, 1880.

No. 7331. A small polished agate, set in silver, found alone, on the surface, on March 5th. This trinket of the present day must have been accidentally dropped by one of the numerous visitors to the Cavern since the four-feet excavation in that part of the Cavern was finished; that is, since February, 1873.

No. 7332. A Flint flake or chip, 3·1 inches long, 1·3 inch in greatest breadth, and nearly ·5 inch in greatest thickness. It retained a small portion of the original surface of the nodule from which it was dislodged, but had no indication of having been used or intended for use. It was found alone, in the Breccia, in the fifth Foot-level, March 6th, 1880.

No. 7333. A Flint flake or chip, 2·5 inches long, 2·2 inches in greatest breadth, and ·6 inch in greatest thickness. It retained a considerable portion of the original surface of the nodule from which it was struck, and was found alone, in the Breccia, in the eighth Foot-level, March 17th, 1880. There

was nothing about it to suggest that it was ever intended for use.

No. 7334. A left last upper molar tooth of Bear, with a piece of bone, found in the Breccia, in the seventh Foot-level, April 1st, 1880.

No. 7335. A Flint nodule, 3·6 inches long, 2·8 inches in greatest breadth, and 2 inches in greatest thickness. It was pretty much rounded, no attempt had been made to fashion it into a tool, and indications of its having been used as a "Hammer stone" were neither numerous nor well-pronounced. It was found alone, in the Breccia, in the sixth Foot-level, April 13th, 1880.

No. 7336. A small Chert chip, found alone, in the Breccia, in the sixth Foot-level, April 24th, 1880.

No. 7337. A fragment of an unusually smoothly-worn pebble, or of the internal cast of an *Orthoceras*, found alone, in the Breccia, in the ninth Foot-level, May 21st, 1880.

No. 7338. A small Flint chip, found alone, on May 31st, 1880, in the Breccia, in the fifth Foot-level.

No. 7339. A Flint nodule-tool, 5·75 inches long, 3 inches in greatest breadth, and 2·7 inches in greatest thickness. In form it approached a four-sided pyramid; at the but-end each face was covered with the original crust of the nodule. The apex was not well formed.

No. 7340. A mass of Flint owing its present irregular form to artificial chipping, but not entitled to the name of Tool. It was 3·35 inches long, 2·9 inches in greatest breadth, 1·8 inch in greatest thickness, and retained a small patch of the original surface of the nodule, where there were a few bruises such as might have been produced by its having been used as a "Hammer-stone." It was found alone, in the Breccia, in the ninth Foot-level, June 15th, 1880, that is the fourth day before the close of the work.

It may not be out of place to remark here that the second, that is the deeper, excavation yielded a greater number of archæological than of palæontological "finds;" and that while no animal relic was found below the seventh Foot-level, the three fine nodule-tools (Nos. 7323, 7328, 7339), were found in the eighth Foot-level, and several Flint chips occurred in the ninth or lowest.

In closing their Report the Committee beg to express their thanks to Lord Haldon for so freely and kindly allowing them the entire control of the Cavern while carrying on the exploration; to the Committee of the Geological Section for

their uniform, firm, and most encouraging support; to the General Committee of the Association for their liberal annual grants during a period of sixteen years, which have resulted in an instance of Cavern-exploration without parallel, it is believed, in this or any other country, for, at least, its continuity and duration; and to the private friends whose timely and kind donations enabled a considerable and satisfactory deeper excavation to be made, and thereby to give the work a nearer approach to completeness than would otherwise have been the case.

Finally, the Superintendents feel that it would be less than just were they to fail on this occasion to state, not merely the satisfaction, but the admiration with which they review the manner in which the work has been done by George Smerdon and his co-labourers in the Cavern. From the first day of the exploration—March 28th, 1865—to the last on June 19th, 1880, Smerdon was continuously engaged on the work, and for nearly thirteen years he was the foreman. During the entire period he not merely discharged his duties in a most faithful manner, but he never had a misunderstanding with the Superintendents.

APPENDIX.

The Cavern still frequented by Living Animals.

Very early in their researches the Committee became aware that numerous small living animals found a home in Kent's Cavern. Indeed, Colonel Montagu, as long ago as 1805, in a Paper on the *Horse-Shoe Bats*, read to the Linnæan Society, recorded the fact that in Kent's Hole "both species" [*Rhinolophus ferrum-equinum* and *R. bifax*] "are usually observed in considerable abundance clinging to the vaulted roof of the interior apartments." The recent investigations, as might have been expected, thinned their numbers considerably; nevertheless the Cavern has apparently not lost the character given it by Montagu, for no longer ago than March, 1883, an eminent physiologist wrote asking if he could be "supplied with living female bats, in good condition, say a dozen or half a dozen at a time, weekly for the next few weeks."

Rats were frequently numerous, especially in the winter months, and often troublesome and annoying.

The following Memoranda were included in some of the Annual Reports in their original form; and when the habit of rats to secrete small objects is borne in mind, it will be seen that such records may be closely connected with problems the Cave hunter may meet with; and are anything but out of place in Reports on Cavern Researches. Nevertheless, it may perhaps be more convenient now to place them all together in an Appendix.

In January, 1867, the workmen observed a rat in the Cavern on several successive days. At length he made his presence felt in a very disagreeable manner. At 9 a.m. the foreman placed his dinner, carefully lodged in a bag, in a stout wicker basket, which he locked. At the dinner hour, 1 p.m., he found that the rat had eaten a hole through the basket, another through the bag, and carried off every particle of the meal.

Bats are often seen flitting to and fro or suspended from the walls, and they sometimes make a meal on the Candles taken to the Cavern by the workmen. In the summer considerable numbers of the Common Shrew are occasionally observed near the Cavern door and in the adjacent thicket. On 8th December, 1869, the workmen were in a state of excitement, caused, no doubt, by an unwelcome visit of some infra-human marauder. They had that morning taken to the Cavern a pound of candles, of sixteen to the pound, and hung them in the accustomed place. On going to cut off one of them at 3 o'clock, it was found that twelve of the sixteen were missing, and the condition of the remnants of the wicks still hanging on the nail was believed to indicate *cutting* rather than *gnawing*. Hence it would have been concluded that the loss was due to a human thief had it been possible for one to have entered the Cavern without the knowledge of the workmen. On examination, one of the missing candles was found between some large loose stones beneath the nail on which the pound had been hung, but no trace of teeth-marks could be found on it. Before the men left work the remnant of the pound had been carried off, but by what agency remained unknown; for though a gin temptingly baited was set at the spot, it failed to aid in the solution of the problem.

Old newspapers, &c., were occasionally sent to the Cavern for wrapping up specimens needing more than ordinary care.

On 28th November, 1871, the workmen, using in this way a part of a copy of the *Saturday Review*, left unintentionally one complete and sound sheet, *i.e.* two leaves, near the spot where they had been working. The next morning they found the paper precisely where they had left it, but with about one-fifth of one of the leaves gone, and the broken margin of the remainder apparently nibbled. There was nothing to prevent the whole from being taken off, and it was noted that, though left in a precarious position, it had not fallen down. The broken leaf was then torn off by the Secretary and preserved, while the unbroken one was allowed to remain by way of experiment. The next morning no trace of it was to be seen. That evening a rat-trap was set at the spot, and another leaf of paper placed very near it, having on it a small stone which it was supposed a rat, but not a weaker animal, might be capable of moving. The next morning the paper was found where the workmen placed it, but very much nibbled; while the trap and the grease with which it was baited appeared not to have been touched. Before leaving work, the men baited the trap with a tempting end of candle, and placed it on a leaf of paper; while another leaf, weighted with a lump of earth, was placed near. On the following morning both pieces of paper were found to be considerably eaten or torn, and it was noted that the injury done to the former was within the margin of the trap placed on it, while the trap itself, as well as the bait, remained unaffected further than that there were on it a few spindle-shaped fæces about a quarter of an inch long. There can be no doubt that some animal, probably smaller than a rat, carried off the missing leaf to a recess in the Cavern, where it may serve to make its nest comfortable, and perhaps hereafter to puzzle a Cavern searcher who may discover it.

In February, 1872, the workmen observed somewhat frequently several large rats in the Cavern, but for some time failed in all their efforts to capture them. One morning one of the men on beginning his work wrapped his dinner bag in the coat he had just taken off, and put the whole carefully aside. At dinner-time the coat was found to be eaten through, and the bag with its contents was gone. A few days after the other man, having taken his dinner, placed his bag containing a piece of bread in a basket, and fastened the cover. On leaving work he found a hole had been eaten through the basket, the bag was torn into the merest shreds, and the bread

was gone. Thus stimulated, the men baited their traps with great care, and caught seven or eight rats.

On one occasion, in 1873, four rats (two old ones and two young ones) were caught in one gin, at one and the same time. The adults were the extremes of the series and were dead, while the others were still alive. Though most prevalent near the entrances of the Cavern, rats have been frequently seen far in the interior, and, indeed, one carried off a candle from a spot fully 300 feet from the nearest entrance.

On Tuesday, 7th October, 1873, a rat carried off six candles in the course of the afternoon, having detached them from a nail, which had been held to be inaccessible even to rats, and had been used for the purpose for a period of three years without any previous loss. Gins were at once set for the marauder, and he was captured on the following Friday. On 29th of the same month another, between the hours of nine and one, ate through the basket in which one of the workmen had placed his dinner of bread and meat, and carried off the meat, but left the bread apparently untouched.

Rats have frequently been seen running about in various parts of the Cavern, including those in which the men were working, though hundreds of feet from any glimmering of daylight; and they have displayed their usual boldness and skill in carrying off candles. In other branches of the Cavern, almost as far from the Entrances, where all researches have ceased for some years, their footprints are to be seen in very great numbers, especially on the silt where the drip is copious in wet weather. It is difficult to understand what draws them thither, unless it be the small amount of tallow which drops from the candles of visitors.

On 29th January, 1875, the Secretary heard a Fly buzzing about the "Cave of Inscriptions," about 300 feet from daylight. It was subsequently *seen* by the workmen in the same Cave.

The foreman, whose special work was that of excavating the deposits, occasionally used a lump of clay, but little if at all less than 2 lbs. in weight, as his candlestick; and when leaving work he removed the candle and placed it in a box, lest it should be carried off by rats, but the lump of clay, which it is

needless to say was more or less covered with candle-grease, he left to its fate. During the latter end of February and beginning of March, 1877, he observed every morning that, not only had the candle-grease been removed during the night, but almost half of the clay—nearly a pound in weight—had disappeared also, as if it had formed part of the meal of the depredator or depredators. Having observed no rats for some time, he was inclined to ascribe the work to bats, of which he had often seen several flying about. On 10th March, however, he saw a rat near his work, prepared a gin for it, and the following morning it was caught.

During the twelve months ending with July, 1879, eleven rats were caught in the innermost branch of the Cavern, fully 380 feet from daylight.

NOTES ON THE HISTORY OF HIGHWEEK.

BY THE REV. S. G. HARRIS, M.A.

(Read at Newton Abbot, July, 1884.)

BEFORE I could make up my mind to prepare such a paper as that which I am about to read, I endeavoured to persuade an old friend—one of the oldest members of the Devonshire Association—to undertake it, whose antiquarian papers are among the most valued contributions to its published *Transactions*—I mean Mr. Davidson; and this partly because I knew no one who would, in my judgment, do it so well; and partly because he had already, some three or four years since, out of long-standing friendship for myself, prepared and presented to me “Notes on the History of Highweek,” running through many centuries. I sent back to my friend, as a loan, his own “Notes,” hoping that he would base upon the fruits of his own research a paper that would, I am sure, have merited your approval. He has, however, resolved to content himself with a paper on Teignbridge, which is within a short distance of Highweek, and has returned the notes on Highweek to me, leaving me at liberty to use them in any way I think fit. While therefore I will endeavour not to merit the criticism, “What is true isn’t new, and what is new isn’t true,” I must beg the Association to impute the imperfections of this paper to the writer, and not to Mr. Davidson.

The earliest information that we possess respecting Highweek comes from the Domesday Survey (commenced in 1080 and finished in 1086), in the reign of William the Conqueror. The modern parish comprises two manors, mentioned in Domesday Book—those of Wick or Teignwick, and Bradley, and perhaps part of a third manor, that of Newton.

Teignwick, one of the old names of Highweek, appears in the Exchequer Domesday Book as *Wiche*, and in the Exeter Domesday as *Wica*. That the name Wick is connected with the Latin "vicus," either by derivation or common origin, scarcely admits of doubt. Some have argued that the name alone is sufficient indication of Roman occupation within the first four centuries of the Christian era; and it is by no means unlikely that a Roman settlement existed at Highweek; for although the small round earthwork at the highest point of the parish, called Castle Field (now known as Castle Dyke), has nothing Roman either in its shape or dimensions, there are other considerations which certainly favour the presumption. The great military Roman road system ended, it is believed, at Exeter; yet, in all probability, in the period of the Roman occupation of Britain, a road was continued from Exeter over Haldon, and passed over a bridge which spanned the river Teign, where Teignbridge now is, and came thence through the present parish of Highweek, a Roman village being built on the hill on which the parish church stands. The word "Wick" is still found on the other side of Teignbridge, in the tenement now called Fishwick.

The first fact that can be stated with certainty about *Teignwick* is, that at the death of Edward the Confessor, on January 5th, 1066, the manor of Teignwick belonged to Ordulf, a well-known chief at that king's court. His name is found attached to a charter of the date of 1044, and is also appended to what professes to be the Foundation Deed * of the See of Exeter in 1050, when the seat of the Western Bishoprick was transferred from Crediton to Exeter. It is an interesting circumstance, according to the narrative in this deed, that this Ordulf, the owner of the manor (Teignwick) was present among the assembled worshippers when, in the year 1050, Leofric, who had been Bishop of Crediton, was conducted as the first Bishop of Exeter to the high altar of the then new Cathedral of Exeter, between King Edward the Confessor and his queen.

After this we hear no more of this Ordulf, beyond the fact that he was living at the time of the Norman Conquest, in 1066. But after this victory of William, Teignwick ceased to be the property of a Saxon, and formed an item in an immense tract of country, which came into the hands of Robert, half-brother of William the Conqueror.

The manor of Teignwick was probably co-terminous with

* The authentic character of this deed, with its narrative of the installation of Leofric, has been seriously questioned.

the present parish of Highweek, except that the present parish comprises what was then the separate manor of Bradley, and probably that portion of the then separate manor of Newton which lies north of the river Lemon, as we now call it, although our forefathers, in the time of King John, called it Limenstream, in a document, of which I have a copy; and which describes a portion of the river near Chercombe Bridge, within the parish, under the designation of Limenstream, as one of the boundaries of the Venville or Fenfield districts bordering on Dartmoor.

The manors of Bradley and Newton were, like that of Teignwick, transferred to Norman ownership after the Conquest. It has been thought that Newton Bushel and Newton Abbot were originally one manor, and that manor called Newenton in Domesday Book; but be that as it may, the names of Newton Bushel and Newton Abbot were much later in date. There seems a probability in connecting the name of Newton Bushel (the town part of the parish of Highweek) with the entering into possession of the manor in which it is situated, of the family of Bussel, or Busschel, in the year 1261; to which I shall have occasion again to refer presently. In like manner there seems a probability in the appropriation of the name Newton Abbot to the southern part of the old manor of Newton (now in the parish of Wolborough), in consequence of the possession of property, after the Conquest, by Ralph de Bruere and his family, one of whom, William de Bruere or Briwere or Brewer, became the founder of Tor Abbey in 1196, in the reign of Richard I., and gave* to that abbey the manor in which Newton Abbot is situated.

In the reign of Henry I., the manor of Teignwick, on account of the rebellion of its Norman owner, William of Mortain, became forfeited to the Crown. Somewhat later, in 1198, in the reign of Richard I., we find it in the possession of Lucas Fitz-John, a Norman, who married Eustachia de Courtenay, a rich widow.

At some unknown date, prior to the reign of King John, a part of the manor of Teignwick became alienated—I refer to a little farm in the parish called Mainbow, near Forches Cross, once spelt Maynbogh, and in Lysons'† *Devonshire*, Mayneburgh; which land was granted by one Walter Gifford to the Abbot of Tor, "for the good," it is said, "of the soul of his lord, Lucas Fitz-John, and of his own soul." This land of Maynbogh, with all the common of pasture of the manor of Teignwick, had been granted to him, Walter

* *Vide* LYSONS, part ii. p. 566.

† Part ii. p. 271.

Gifford, by Lucas Fitz-John, for the service of rendering one pair of gilt spurs at Easter. Maynbogh continued to be the property of the Abbey of Tor until the Dissolution, when it was purchased by James Gaveroch,* who conveyed it to Sir Richard Reynell, of Forde. Having† passed by successive female heirs to the families of Waller and Courtenay, it was exchanged for other lands with the late George Templer, Esq., of Stover, and is now the property of the Duke of Somerset.

In the reign of Henry III. the manors in the parish of Highweek, of which I have been speaking, are found in the possession of Theobald de Englesheville, to whom these manors, together with other lands which had belonged to Lucas Fitz-John, were by formal deed granted by that king in 1247, with a right to hold a Tuesday market. A few years after this—in 1262 (the 46th year of Henry III.)—we find a legal deed, executed by Theobald de Englesheville, with which the modern history of Highweek may be said to commence. By this deed the said Theobald de Englesheville granted and conveyed to his “kinsman and heir,”‡ Robert Bussel, the Manor of Teignwick,§ with all its appurtenances in the county of Devon. This grant of the manor of Teignwick to Robert Bussel, being confirmed by the king, had the effect of alienating the manor, with its appurtenances, completely and for ever from the Crown, and placing it in the hands of a private owner, to the benefit, doubtless, of the estate, and of those who lived upon it. There is no doubt that this grant to Robert Bussel included the manors of Bradley and North Newton—the latter being now qualified to acquire its modern name of Newton Bushel from this family of Bussel. It is probable that the Manor-house at Bradley came in time to be the one house for the lord of the three properties—Teignwick, Bradley, and North Newton. This Robert Bussel did not enjoy the property more than about six years, and died 1268 (the 53rd year of Henry III.), leaving a son and heir, Theobald Bussell, a boy of five years old.

It was during the minority of Theobald Bussel that the Commissioners appointed by King Edward I., on his return

* This name, differently spelt, and referring to persons in apparently different social positions, occurs frequently in the Parish Registers down to a recent period. † See LYSONS, part ii. p. 272.

‡ “Consanguineus et heres,” said by Prince (*Worthies*, ed. 1810, p. 771) to be his sister’s son.

§ Sometimes spelt Teignwyke, Teynewik, Tingwike, Teignwyk, and Tengewyk.

from the Holy Land, to inquire into the state of the demesnes of the Crown, and a great variety of other particulars of revenue, made their return, commonly known as the Hundred Rolls. The inquisition into the deductions and excesses, from and beyond the Royal rights and liberties, made and committed by the sheriff, coroner, escheator, and other bailiffs of the county of Devon, was made between the 20th November, 1274, and the same date in 1275.

It appears from the Hundred Rolls of this county that during the minority of the boy, Theobald Bussel, there were sundry disputes about his legal rights, but into the particulars of these I will not enter, as not being of very general interest. There is, however, one point that came out in the course of these disputes which will be interesting to many, inasmuch as it refers to a custom once well known in our county, and is connected with a well known spot in Highweek parish—I mean Forches Cross. Jurors reported that the guardian of the boy, Theobald Bussel, then lord of the three manors in the parish, had “furcæ,” gallows, or power of capital punishment, and assize of bread and beer, in the manor of Teignwick—rights which are often mentioned in manors that had belonged to the Crown; and the right of sending felons to the gallows seems to have been a relic of Royal prerogative annexed to the land. Our forefathers, it will be remembered, down to a comparatively recent period, executed criminals, not, as now, at a county gaol, but near the scene of their crime. The “furcæ,” or gallows, probably stood at the spot in Highweek parish, within the ancient manor, still called *Forches* Cross. Persons acquainted with the neighbourhood of Dartmouth, and the inland road from thence to Kingsbridge, may remember that about six miles from Dartmouth, near Oldstone, and in the parish of Blackawton, is also a site called Forces, but whether in that case there is any possible connection with “furcæ” I am not aware.

This Theobald Bussel of whom I have been speaking, died at an early age, leaving a son, William Bussel. To him it is recorded, that King Edward II., in 1309, granted the right of holding two fairs in his manor of “Bradelegh;” one on the two days before Ascension-day, on the day itself, and on the morrow of the day; the other on the two days before the Feast of * All Saints (Nov. 1), on the day itself, and on the morrow of the day.

* The present parish church of Highweek, erected in 1428, is dedicated to “All Saints.” The church which occupied the same site previously to that year was similarly dedicated, as appears from Dr. Oliver. *Monasticon*, p. 449.

This William Bussel, or, as he is now called, Busshel, died on the 10th of June, 1346; he left two sons, William, his heir, and John, and a daughter, Elisote, or Elizoute (answering, doubtless, to our "Elizabeth"). She was married to Roger Atyard, or Yard, otherwise spelt Yarde, or Yerde, who was descended from an ancestor of the same name, who lived at Yard, in the parish of Malborough, near Kingsbridge.

This son, William Busshel, died in 1359, leaving his brother John his heir. A son of this John Busshel, another John, who succeeded him, died in 1391, either without children or without any who survived their childhood. In consequence of this failure of heirs in the family of Busshel the estates passed, in or about 1391, to Thomas Yarde, son of Elisote Busshel, after her marriage to Roger Yarde. Thus the Teignwick family of Busshel disappears, and is succeeded by that of Yarde.

Thomas Yarde, who thus inherited the Busshel estates in the parish of Highweek, had a son, Richard, who married Joan, one of the daughters and co-heiresses of William Ferrers, of Churston. To this day may be seen, on the font in Highweek Parish Church, the arms of the family of Ferrers, as well as of Yarde, the arms of the Yardes being the same as those of the Busshel family. This Richard Yarde, who married Joan Ferrers, seems to have been the most active, the most distinguished, and probably the wealthiest member of his family; he is one of the Worthies of Devon commemorated by Prince. The present Manor-house of Bradley, "no less famed for its antiquity than admired for its situation," and stated in Lysons' *Devonshire* to be a building of the 15th century, was probably the work of this Richard Yarde. It is said that when this mansion was built some parts of the older dwelling were preserved. "It originally formed a quadrangle," Lysons state; "but two of the sides have been taken down; the chapel and the hall remain, and the gateway," says Lysons' account of Devonshire in the year 1822. An interesting plate, representing the old mansion at Bradley in that year, is given by Lysons in Part II., opposite page cccxlvii; but a high wall, as there represented, which concealed a large part of the front of the mansion, has since been removed. The chapel at Bradley Manor House is believed by Dr. Oliver to have been built by Thomas Yarde, son of Roger Yarde, who married the heiress of the Busshel family. At all events a licence was obtained by the lord of the manor from Bishop Lacy, of Exeter, on February 7th, 1428, to have divine service performed in the chapel near his own mansion—"In

capellâ suâ infra mansionem de Bradeleigh juxta Newton Bushell." The arms of Bishop Lacy were seen by Dr. Oliver (as appears from a letter of his, dated Exeter, 14th April, 1855) "in a nodus of the chapel roof."

Presumably in the time of the same Richard Yarde (who is believed to have been the builder of most, if not the whole, of the mansion at Bradley), what was called "the chapel of Highweek" was rebuilt; for, as I shall show presently, there was an older church at Highweek before. In other words, the present parish church of Highweek was built, and dedicated on April 19th, 1428. A few years after, in the year 1443 (21st and 22nd of King Henry VI.), it appears that this Richard Yarde was Sheriff of Devon, and in the same year founded the Chapel of St. Mary, in Newton Bushel. He died in the seventh year of King Edward IV., 1467, and in consequence of his marriage (as I mentioned) with an heiress of the Ferrers of Churston Ferrers, his elder son did not succeed him at Bradley, but went to live at Churston, where he was succeeded by a long line of descendants of the name of Yarde, until the last lady of the family married Sir Francis Buller, a judge of the King's Bench, and they joined their names and properties together, and became the founders of the well-known family of Yarde-Buller, now represented by Lord Churston. The next owner of Bradley was Gilbert Yarde, a younger son of Richard Yarde, of whom I have been speaking.

Risdon's *Survey of Devon* gives a list of Yardes who were successively owners of Bradley, and other property in the parish, from 1467 down to 1751, with some particulars relating to them. Many of their names are still visible on a wall of Bradley Aisle in Highweek Church, but I must not linger over them. I must not, however, forget to mention an interesting circumstance in connection with one of them: The silver Paten—which forms a part of the Communion Plate of Highweek Parish, and is still constantly used in the administration of the Holy Communion, has on it an inscription, recording that it was "given for the use of the Holy Sacrament by Gilbert Yearde, Esq., in the year 1685." The flagon likewise, which is still in use, bears the arms of the Yardes. In the stormy period of the Civil War, in the middle of that century, we find that Sir Thomas Fairfax, the Parliamentary general, was for a night quartered in Newton Bushel; viz., on the 24th of January, 1646. (See Moore's *History of Devonshire*, p. 214. Lysons', part ii. p. 272.)

The last owner of Bradley of the name of Yarde, in the year 1751, sold the Manor of Teignwick and the Barton of

Bradley to Thomas Veale, Esq., who gave them to his nephew, Thomas Lane, Esq., of Coffleet, near Plymouth, whose son, the Rev. Richard Lane, is remembered by many as the owner of Bradley, until the property was again sold, somewhat more than forty years since, to the late esteemed owner, the Rev. F. S. Wall, the father of the lady who now enjoys it.

I must not omit to give a brief account of the religious provision for the district in ancient times, and in particular (as I promised) before the building of the present parish church, which, I have mentioned, was dedicated in the year 1428. Sir William Pole states that "Highwike lieth in the parish of Kingsteignton, but hath a Chappell of Ease. Tingwike and Newton Bushell and Bradleigh," he says, "are parcell of the parish of Kingsteignton, and Newton Bushell hath a chappell in it." He adds that "the chapel of Teynewik (*i.e.* the church which stood previously where, in its commanding and unrivalled situation, Highweek Church now stands) is said to be mentioned in a deed of Bishop Brewer between 1224 and 1244, and again in a Bull of Pope Innocent III., in 1245. It is mentioned also in what is called the "Taxation" of Pope Nicholas IV., about the year 1288.

It would appear that, until the early part of the 15th century, this ancient building, known as Teignwick Chapel, enjoyed all parochial rights but that of sepulture; and that this right of sepulture was granted by Bishop Lacy, of Exeter, when the present church at Highweek was substituted for it, and with its burial-ground was dedicated to All Saints on April 19th, 1428. Bradley Aisle, as it is called (being attached by prescription to that property), at the east end of the north aisle of Highweek Church, and which varies a little in its stonework from the rest of the church, was probably coeval with the main portion of the fabric, and constructed for the use of Richard Yarde, of Bradley, and his descendants. The south aisle of Highweek Church is probably more recent; it has been supposed of the date of Queen Mary, in the middle of the 16th century.

As regards the dedication of the burial-ground, now Highweek Churchyard, by Bishop Lacy, of Exeter, a curious document is in existence, or at least a copy in substance of it, containing a petition from the inhabitants of the parish to Pope Martin V., in the early part of the 15th century, representing the distance from the mother church of Kingsteignton, the bad state of the roads, and the danger of attending a corpse in time of inundations from the river Teign, and praying "His Holiness" to be allowed to bury their dead at

Highweek. The process was somewhat circuitous, to send a petition from Highweek to a foreign Bishop residing in Rome, requesting him to request the Bishop of Exeter to allow the people of Highweek to bury their dead in a churchyard in their own parish. But so it was, and the Pope, acting on his assumed right, graciously recommended the case of the people of Highweek to Edmund Lacy, Bishop of Exeter, who accordingly consecrated a cemetery at Highweek with a new *chapel* (as it was called), the present church, in 1428. The parishioners had been wont to bury their dead in the yard of the mother church of Kingsteignton, a right which was said still to exist down to the year 1864, when an order of the Queen in Council separated ecclesiastically the parish of Highweek from that of Kingsteignton, and abolished all ecclesiastical rights held by the inhabitants of one parish in the other parish, including the abolition of a payment of the sum of ten shillings, which down to that time was always paid year by year out of the church rate of Highweek to the mother church of Kingsteignton.

It is somewhat uncertain when Highweek first became a parish, but probably between the years 1196 and 1244. From the nature of the case it would be subsequently to the severance of the Manor of Newton, a part of which, as stated in an early part of this paper, is believed to have been on the southern side of the river Lemon, and in the ordinary course the parish would be assigned, when the original chapel, before the time of the present Parish Church, was built; *i.e.* before the year 1244. The civil parish of Highweek having continued to form with Kingsteignton one ecclesiastical parish or benefice down to the year 1864, Kingsteignton Parish may long have continued to be spoken of as embracing the parish of Highweek within its limits. Accordingly we read in Lysons' *Devonshire*, part ii. p. 600: "The hospital (or lazar-house, now become alms-houses) founded by John Gilbert, in the parish of Kingsteignton, in 1538, is now esteemed to be in the parish of Highweek, formerly parcel of Kingsteignton." The acreage of the parish is 2422. Certain entries on a fly-leaf of one of the Register Books enable me to record the variations in the population of the parish in decennial periods of the present century. In the year 1801 it was 777; in 1811 it was 823; in 1821 it was 907; in 1831 it was 1109; in 1841 it was 1301; in 1851 it was 1398; in 1861 it was 1571; in 1871 it was 1625; and at the last census, in 1881, owing to a great increase in the number of houses, the population reached 2164.

REMARKS ON OLD TEIGN BRIDGE.

BY JAMES BRIDGE DAVIDSON, M.A., F.S.A.

(Read at Newton Abbot, July, 1884.)

THE valley of the Teign, in the neighbourhood of which the Association meets this year, presents no more interesting feature of antiquity than old Teign Bridge—a structure, or rather series of structures, which has already revealed much as to the local history of past times, and may possibly disclose more.

Bridges, when first constructed, were naturally built, for the most part, at the situation of much frequented fords; and when a river was a tidal river, having an inflow and outflow of the sea for some distance along the lower part of its course, it is obvious that the lowest ford on the river could generally never be lower than the head of the tide-flow. A ford across an estuary of the sea is almost an impossibility. When the tide is in, a ferry may be set-up by means of flat-bottomed boats, which are gradually stranded as the water becomes low; but when the tide is out, there is, besides the fresh-water stream, a reach of mud to be crossed which affords no secure footing either for men or animals. So that, as a rule, there is no crossing a tidal river on foot, lower than the point to which the sea-water rises. Thus it occasionally happens that the site of a bridge marks the point to which the sea formerly flowed, at or before the time when the bridge was built.

Of manors in Devonshire, named after bridges, there are several in *Domesday*. Two of them were called Brycg or Bridge, spelt by the Normans Brige, 114(4); and Birige, 104(2). The more important of these was the manor called Brycg, from the bridge over the Tamar. This was, at that time, no doubt, the lowest, and hence most important, of the bridges over that river. The manor of Brycg or Bridge lay

on either side of the stream, being partly in Devon and partly in Cornwall; but the whole, whether in Devon or Cornwall, was reckoned part of the hundred of Toriton. The modern name of the parish is Bridgerule, which is partly in Devon and partly in Cornwall, but wholly in Black Torrington hundred, and in the deanery of Holsworthy.

At the death of King Edward, this manor was in the tenure of one Frawin, and by William it was bestowed upon his faithful adherent, Ruald Adobed. We cannot feel any doubt as to why this estate, comprising within it both approaches to the bridge, was committed by the Conqueror to the charge of this experienced warrior, and trusted comrade-in-arms. Unquestionably it was in order that this post of observation and military control should be in the keeping of one who was both able and willing to defend the frontier, and to keep the peace between the Saxon Defnas on the east of the stream, and the British or Cornu-Welsh on the west of it.

Ruald Adobed is one of the earliest knights of whom English history makes mention. The name Adobed is merely a contraction of "adobatus," which is the Latin form of the Norman word "adobè,"* signifying one who has been "dubbed" a knight. Ruald, or Rhiwallon, was the seigneur who, in the war between Normandy and Brittany, held the fortress of Dol, in Brittany, against his own lord, Conan of Brittany, in favour of William, Duke of Normandy. In this contest Harold, son of Godwine, and afterwards king of England, was the guest and companion of William. Harold accompanied William on the expedition. In the Bayeux tapestry, on the march to Dol, in crossing the boundary stream of the Coesnon, Harold is represented as dragging William's soldiers by main force out of the quicksands in which they are sinking. Then the fortress of Dol is depicted. Conan is laying siege to it. A man, despatched by Ruald, is let down from the walls by a rope, in order to report to William the state of affairs in the beleaguered town. At the approach of the Normans, Conan takes to flight, and escapes with his army to Rennes. Afterwards William and his forces are seen attacking Dinan. Conan is subdued, and delivers the keys of the surrendered capital to William, at the point of a lance. After this William "gives arms" to Harold, or, as it would be said in later times, invests him with the order of knighthood. In all probability, on this occasion it was that William, in the hour of conquest, conferred a like

* *Recherches sur le Domesday*, par MM. Léchaudé d'Anisy et De Ste. Marie, p. 59.

honour on his Breton ally, Ruald. In any event, Ruald Adobatus, the "dubbed knight," accompanied William in his invasion of England, and was rewarded with the gift of a house in Exeter, a considerable number of manors in Devon, and amongst the rest this manor of Brycg, or Bridge. Here he would stand as a barrier between the Saxon and the Briton of Cornwall, as before he had stood as a barrier between the Norman and the Breton of Brittany.

To the above particulars of Ruald's life we are able to add one more item, namely, that the Breton knight terminated his life of warlike adventure by becoming a monk, and entering the priory of St. Nicholas, Exeter, which was an affiliated house in Devonshire to William's great abbey of Battle, on the hill of Senlac. This appears from the cartulary of the Priory,* where it is stated that Bishop Osbern, of Exeter, confirms to the church of St. Nicholas, Exeter, the gift of land made by Ruelant Ladubed, "in die quo factus est monachus in eadem ecclesia," namely, the land of Pochellæa (Poughill), and the church of the same manor. This land, which comprised only a small part of the parish of Poughill, appears amongst the *Domesday* possessions of Ruald Adobed. So much for the bridge over the Tamar, which perpetuates the memory of the Breton knight and monk, Ruald.

The other manor of Brycg also bears the name of its *Domesday* owner. It was a manor of moderate size, lying apparently on either side of a small stream, without a name, which, flowing from east to west, falls into the Taw at Bishop's Tawton. The owner was Sawin, the priest, 104(2), from whom a large parish, comprising not only the Bridge manor, but several others, has obtained its modern name of Swimbridge.

Thelbridge, a parish in Witheridge hundred, appears in *Domesday* under the form Talebrige, 103(2). The name denotes a plank or timber bridge. In King Edward's day this manor belonged to Ulveva. It passed to Geoffrey, Bishop of Coutances.

The Brigefords of *Domesday*, 106(3) and 112(4), also Brisforde 117(1) may mark the sites of bridges that have been erected at fords.

Several farms in Devon take their names from bridges, but

* Cott. Vitell. D. ix. No. 37. The deed is also printed by Dr. Oliver, *Monasticon*, p. 119, but from so corrupt an original, "ex archivis civitatis," presumably Exeter, that the name of the grantor is disguised under that of "Baialandus Ladubed." The learned Doctor seems however to have suspected that Ruald Adobed was meant; at any rate, he is reminded of him. See the foot-note.

the only parish with a name thus derived, not to be found in *Domesday*, is Kingsbridge.* How this parish acquired this name seems to be unrecorded. A happy conjecture has been made that the "bridge," in "Kingsbridge," is a corruption of "burgus," a borough—Kingsborough; just as Bridgewater is said to be derived from Burgus Walterii. Kingsbridge parish seems to have been carved out of Churchstow; it is only thirty-two acres in extent. Churchstow itself also is not named in *Domesday*;† but no doubt it is there represented by the Abbot of Buckfast's manor of Norton, which is in Churchstow parish.

Returning to Teign Bridge, we find that in *Domesday* this name occurs only as that of a hundred. There is no manor thus named; but just as the parishes named after bridges, Bridgerule, Swimbridge, and Thelbridge, comprised both extremities of the bridge, so it appears that the hundred of Teignbridge lay on either side of the river.

We now come to the more special points of interest relating to the structure of old Teign Bridge. The statement which follows is taken from a paper‡ read before the Society of Antiquaries on the 5th of March, 1818, by P. T. Taylor, Esq. The exact words are given, as the account is concise, and is the only evidence on the subject we possess. Mr. Taylor says:

"In the year 1814 the justices of the county of Devon resolved at their Quarter Sessions to rebuild the bridge over the river Teign (commonly called Teign Bridge), situated on the turnpike-road leading through Newton Abbot and Totnes to Plymouth.

"In 1815 the work commenced . . .

* As the writer was reminded during the discussion which followed the reading of this paper, the bridge at Kingsbridge is so insignificant as to be unworthy of commemoration.

† This is not a singular instance in the case of parishes with names ending in "stow." Thus Christow (Won.), for Christenstow, the stow or place of St. Christina, Virginstow (Lift.), the place of St. Bridget the Virgin, and Maristow (Lift.), are neither of them given in *Domesday*. The former is represented by Teigne (Canon Teign), and other manors; the second by Bradeford (Bradford) and others; and the last by Sidreham (Sydenham) and another. The fact is that in these instances the religious centre of the manor, the stow or "place" with the cross, chapel, or church upon it, happened to be in a different spot from the centre of business of the principal manor to which the church belonged. Thus secularly each manor went by its own name; afterwards, when several manors were all grouped together, and served from the same religious centre, that centre gave its name to the united parish. Of this arrangement Malborough, in the South Hams, is a very striking example. The parish contains a group of manors all named in *Domesday*; but the name Malborough itself does not occur. Zele Monachorum is another instance.

‡ *Archæologia*, vol. xix. p. 308.

"The river Teign rises in Dartmoor, and after a course of twenty-five miles, during which it receives many tributary streams, discharges itself into the sea at Teignmouth. The common tides reach no higher than the old weir for catching salmon, about half a mile below the bridge; but the spring tides (according to the report of Mr. J. Green, the surveyor of the county) * rise nearly as high as the level of the water at the bridge.

"Without doubt the estuary, which now terminates at the old weir, extended formerly for several miles above Teign Bridge, and many hundred acres, then covered by every tide, are now, by the accumulation of alluvial soil, converted into rich pasturage.

"The bridge of two arches, through which the river flowed in 1815, before the new work began, was built of *grey* limestone in a very rough manner; the arches were turned on abutments of 21 inches thick, erected on the springs of the arches of a former bridge, the angles of which springs projected 3 feet from the piers; so that the waterway below those springs was 20 feet clear, and above them 16 feet and a half. The time when even this bridge was built is unknown, and it was certainly a very ancient structure.

"The second, to be called for distinction the *red bridge* (it being being built of a hard fine red sandstone, rising in strata in the adjoining parish of Bishops Teignton), was a work executed with great care; the masonry and cement excellent. The arches were turned with the red stones, 20 inches in length, and from 3 to 5 in thickness. Immediately above them another arch was turned of the same stones, 17 inches in length, and projecting 2 inches over the lower arch; the piers and abutments were also of the same stone. . . . The first and second arches of the red bridge were destroyed to build a higher bridge on their springs, as before noticed; the third was buried in the alluvial soil, but perfect in 1815, when it was destroyed to make room for one of the platforms laid to receive the foundations of the new bridge; the fourth and fifth still remain entire, and buried under the road.

"On sinking under the first arch of the red bridge to lay the other platform, rhomboidal frames of oak were discovered bedded in a stratum of loose stones and gravel. On the angles of these frames the pier and the abutment were built. These frames had evidently, from their position, no relation to the superstructure, but were probably the basis of a *wooden bridge* in use prior to the building of the red bridge, and the places where upright pieces had been morticed to these frames were visible. . . . Under these timbers no ancient work was discovered; but, on removing the pavement of coarse stone under the third arch, a frame of oak timbers, of the same square dimensions, but of a different form,

* "The old arches of Teign Bridge spring at $\frac{1}{10}$ of a foot above the common height of spring tides, or at such time of the spring when at Teignmouth the tide rises 22 feet.—(Signed) JAMES GREEN, Surveyor of county bridges."

was discovered at exactly the same depth with the frames of the first arch, which was evidently a continuation of the wooden bridge. On this being removed, the piers of *another bridge of fine white freestone*, ashler laid, were discovered. One pier of the red bridge was built perpendicular on one of these piers, their dimensions being the same; but the waterway of this bridge had been 21 feet 6 inches; therefore the corresponding pier was not perpendicular on its base, but overhung 18 inches, which 18 inches rested on the wooden frame. These white-stone piers stand on wooden platforms, 22 feet 5 inches below the level of the meadow, 15 feet 5 inches below the surface of the river; and the platforms on which the abutments of the new arch, 50 feet in span, are built, are laid at the same depth."

The writer then proceeds to offer his suggestions that the upper or grey bridge was a work of the sixteenth century; that the red bridge was built "in the saltmarsh" in the thirteenth century, "since which time there has been an accumulation of soil to the depth of 10 feet;" that the third, or wooden bridge, was as old as the Conquest; and that the fourth or white-stone bridge was a Roman work.

It is upon some of these conclusions of Mr. Taylor's that a little new light may be brought to bear. With regard to the date of the first or grey-stone bridge, indeed, nothing has been found. It may, as he says, have been a work of the sixteenth century, or more probably, as after considerations may show, in the seventeenth; but, with regard to the second or red-stone bridge, we find, from Bishop Lacy's registers, that on the 12th of January, 1434, Bishop Lacy granted "an indulgence of forty days to sincere penitents contributing to the building or repairing of Teignbridge."* Thus the date of the red bridge is fixed at the year 1434, and not in the thirteenth century, as Mr. Taylor supposed.

Then, with respect to the third or wooden bridge, we are able to show not only that Mr. Taylor was justified in assigning it to about the date of the Norman Conquest, though not quite so far back as that event, but that it was built probably in about the year 1084. This appears in the following way. Amongst the documents collected together in the *Exeter Domesday*, and printed in Sir H. Ellis's fourth volume, besides a transcript of the rolls which were sent to Winchester, and made up into the Exchequer *Domesday*, is a document of a totally different class, called the *Inquisitio Gheldi*, or *Geld-Inquest*. This is not, like the former, an assessment roll, but is an actual return of a special tax,

* OLIVER, *Ecc. Antiq.* i. 178 (n.).

levied in a particular year, at a specific rate. This tax was the Dane-gelt; the date was the winter of 1083-4, and the rate was six shillings on every hide of land, according to the old assessment of king Æthelred, originally made in 991. It is related that on the day after All Hallows mass-day (All Saints'-day), that is, on the 2nd November, 1083, queen Matilda died, and William, according to Matthew Paris,* becoming, after this event, much more avaricious and tyrannical than before, imposed the Dane-gelt, which had hitherto been allowed to lie dormant through the reign of Edward the Confessor and his own, at the excessive rate above mentioned, the ordinary rate being two shillings, or thereabouts. The *Inquisitio Gheldi* is the return of the commissioners who were employed to levy this tax. The great survey of *Domesday* was not made till 1085-6, two years later; and it is highly probable that the disclosure caused by the *Geld-Inquest* of the imperfections and inequalities of the old assessment of Æthelred was the main cause which induced the king and his advisers to have the new survey made.

However this may have been, the fact which concerns our present inquiry is that the hundred, which in 1083-4 was called Taintona, was, in 1085-6, called Tanebrige.† In other words, at some date between 1083 and 1085, the place of holding the hundred court was removed from Taintona, Kingsteignton, the town, to Tanebrige, the bridge; and it is no violent assumption to suppose that the removal took place, because the wooden bridge was then first made (the older stone bridge having become broken and useless), to suit the convenience of the hundredmen coming from the manors west of the river.‡

By far the most important feature, however, in Mr. Taylor's narrative is the discovery of the stone piers underlying all the superimposed piles of building at this spot. If these be indeed of Roman workmanship, we have here the only instance of Roman masonry known to exist west of Exeter. Indeed, with the exception of the Roman foundations of walls and other subinterred fragments of buildings in Exeter, and the residence of the Roman tax-collector at the extreme

* Part ii. 8.

† This further appears from the two lists of hundreds preserved in the Exon *Domesday*, and printed in Sir W. Ellis's fourth vol. pp. 56-7; but as there is nothing to show the respective dates of these lists, no conclusion can be drawn from them.

‡ This wooden bridge would, in the speech of the time, be a thelbridge, like those above referred to; and from some of the observations made by Mr. Taylor, it seems probable that it may have been fitted with uprights to carry a roof for the shelter of the assembled officers and suitors of the court.

east of the county,* these stone piers of Teignbridge, buried from fifteen to twenty feet below the surface of the soil, are the only known unquestionable remains of Roman architecture in the county.

But besides the piers the core of a road, to carry which the white-stone bridge was apparently made, was also laid bare, and considered by the explorers of 1814 to be also Roman. This gives rise to a further speculation. If this be a Roman road, was it an old road formerly crossing the saltmarsh by a ferry of some kind? or were the road and bridge both newly made together? Conjecture on such a point may to many seem idle; but the probability seems to be that the older road through Chudleigh and over Chudleigh Bridge being found inconvenient, the Roman engineers thought it worth while to effect a lower crossing over the Teign, and thus, amongst other things, get a shorter route to Totnes.

Following out this theory, the next consideration is, Why did the older road from Exeter over Haldon come down to the spot now occupied by Chudleigh Bridge, and not lower? We should be disposed to answer, "Because the site of Chudleigh Bridge was then just above the head of the tide-flow of the river Teign." The red-stone bridge, as we have seen, was of five arches, each 18 feet wide, with four piers between of 12 feet in width. This makes, in 1434, a waterway when the tide was in, and a breadth of mud or marsh when the tide was out, of 138 feet. The span of the present bridge, consisting of one arch, is 50 feet. Such being the diminution in four centuries, there must probably have been a much greater breadth of waterway ten or eleven centuries before. Then the name Bellamarsh, and the markings of the geological chart, seem to indicate that the saltmarsh once extended to about half a mile below Chudleigh Bridge.

As to the rate of accumulation of soil in the valley near Teignbridge, it will be remembered Mr. Taylor says that since the building of the red-stone bridge, which he attributes to the 13th century, there has been an accumulation to the depth of ten feet. We now know this bridge to have been built in 1434.† This would give a rate of accumulation of

* The Roman villa at Holcombe, Uplyme, was situated at the point indicated by the upper left hand extremity of the letter "H" in "Holcombe," as engraved in the Ordnance Sheet, No. xxii.

† As the wooden bridge was built in 1084, and the grey-stone bridge was ruinous in 1814—the red bridge having come between—we get an average duration of 243 years for each of the three bridges, starting from the years 1084, 1827, and 1670 successively. Now 1434, the actual date of the red-stone bridge, is nearer 1327 than 1570, so that there can be no doubt that it was to the red-stone bridge that Bishop Lacy's indulgence had reference.

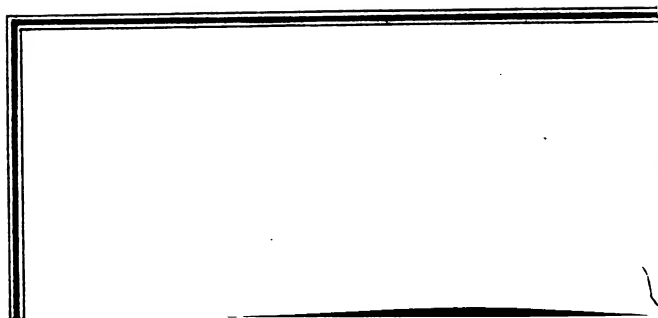
ten feet in 380 years, or $2\frac{2}{3}$ feet in a century. A more likely average for a longer period would be about a foot or a foot and a half in a century.

As to the greater extent of the tide-flow up the Teign in past centuries other evidences are not wanting. The towns of East and West Teignmouth are separated by a rivulet, formerly called the Tame. Upon the banks of this little stream, now mostly covered by houses and arches, salt was made so lately as in the year 1044.* More remarkable are the names of the two farms Higher and Lower Wear, the former in Kingsteignton, the latter in Bishopsteignton parish. Of these farms the homesteads are now distant 360 yards from the highest margin on the shore reached by the tide. But when they were named, that is, about three centuries before the Conquest, or eleven centuries ago, they must have stood on the edges of pools that were daily entered by the sea.† A levelling instrument would determine the exact fall in altitude of the surface of the sea-water since the latter half of the eighth century; and as the state of the sea-beach informs us that this fall is not due to an upheaval of the land, we can attribute it only to the sea-water having been forced back by the accumulating deposit that has been going on in the valley unceasingly. Should the same state of things continue, we may be sure that the basin, now displaying a surface of salt water and mud alternately, which stretches from near Newton to Teignmouth, will become, first a salt marsh, and finally a tract of fertile land, intersected by the fresh-water river, and drained, it may be, by culverts and channels. It by no means follows, however, that the highest portion of the bay will be the first to become dry. A bank is more likely to be formed opposite Bitton and below Shaldon Bridge, and there the river will probably be narrowed sooner than at a higher point.

This subject of the retirement of the sea from the rivers of South Devon is too extensive to be pursued here; but it is one of great interest to the topographer, who will be greatly aided in his researches by the observations of the geologist.

* *Trans. Devon. Assoc.* (1881), xiii. 113.

† Some particular system of fish culture, it is supposed, was served by these pairs of wears, which occur also on the Exe, where we know they are as old as the reign of Æthelstan, A.D. 737, K.C.D. 369 (ii. 205), and as a friend informs the writer, in the Somersetshire Axe. There was a time, probably, when Bishopsteignton was part of Kingsteignton, and on the occasion of a portion of the royal manor being severed and made over to the bishop, the division was so arranged, as that the upper fish-pool belonged to the king, and the lower to the bishop.



SOME ANCIENT ROADS IN SOUTH DEVON.

BY RICHARD W. COTTON.

(Read at Newton Abbot, July, 1884.)

WHEN Leland, the antiquary, visited Cirencester, in the year 1538, and discoursed with the abbot, who appears to have been himself somewhat of an antiquary, about "the iiii. Wayes made by the Britons,"* one of those mild controversies which stir without vexing the archæological atmosphere was opened, and it has scarcely yet closed. Later in the same century the assumed British origin of these great roads was disputed by the illustrious Camden, who wrote: "So far am I from believing it, that I dare confidently avouch, the Romans by little and little founded and raised them up."† Roger Gale, whose learned and copious "Essay towards the Recovery of the Courses of the four Great Roman Ways," printed in Leland's *Itinerary*, appeared at the beginning of the eighteenth century, took, as his title shows, the same view of their origin. Although limited by this view, it is by far the most important treatise which has been written on the subject.

But the title of Gale's essay is misleading, if it does not contain an actual misnomer. We certainly do not find anything about four pre-eminent ways in the Roman road-system, as it is revealed to us in the imperial *Itinerary* of Antoninus. It was not, in fact, until Anglo-Saxon times that the Four Ways obtained, as such, their distinctive appellation and importance. At the dawn of our history they were known to cross the Island in different directions, and were popularly supposed to reach from sea to sea. Occasional traces and fragments of them only now remain, and their courses from beginning to end, if a beginning or an end to any of them can with any certainty be determined, are, as might be

* LELAND's *Itinerary*, 2nd. ed. v. 62.

† *Britannia* (HOLLAND's translation), p. 64.

expected at this distance of time, not easily made out. But after the lapse of fifteen centuries they are still conspicuously marked in the chorography of the country. To identify them, and to interpret their history, may be small matters ; and so they are, if to the student of history anything which, however slightly, throws light upon the acts and monuments of the earlier ages can be indifferent, uninteresting, or useless.

Probably the earliest strictly historical mention of these great ways occurs in the reign of Ælfred, A.D. 878, when the Watling Street is named as a frontier-line, in the division of English territory made by the treaty of Wedmore between Ælfred and Guthrum the Dane. Four and a half centuries had then elapsed since the departure of the Roman legions. The first waves of Saxon invasion had rolled across the land, and most of the Roman towns had in succession perished in flames ; but the less destructible imperial roads which connected those towns probably remained but little injured. The invaders were not famous at any time as architects, military engineers, or road-makers ; whether for that very reason, the more impressed by the remarkable length of the great roads to the possession of which they had succeeded, by the boldness and directness of their courses, or by the marks of structural grandeur which the Romans had left almost indelibly stamped upon them in many places, we cannot tell, but the Four Great Ways acquired a prominent economical importance in the later Anglo-Saxon period, which gave them their peculiar distinction. In the reign of Eadgar, 959-975, and afterwards under Eadward the Confessor, they were protected by the "King's Peace," a privilege by which any offence committed on them was tried, not in the local court, but before the king's own officers. Again, in the laws of William the Conqueror, they appear as the *quatuor chemini*. These were the original king's highways. Henry of Huntingdon, the first part of whose *Chronicle* was given to the world in 1135, has left an account of the Four Great Ways, and of their origin ; literal, however, as it is, both internal evidence and the context show that it is not history, but only a reflection of the contemporary popular notions on the subject. "So important," he writes, "was the safety of Britain to its loyal people that, under royal authority, they constructed four great highways from one end of the island to the other, as military roads, by which they might meet any hostile invasion. . . . These are the four principal highways of Britain, which are noble and useful works, founded by the

edicts of kings, and maintained by venerated laws."* Geoffrey of Monmouth, whose highly-coloured, and in some respects fabulous, work appeared about the same time, gives a somewhat similar but more specific tradition, attributing the construction of these national roads to British kings before the Roman Conquest, at a time when "the whole island, from sea to sea," was under one sovereignty.†

It must be confessed, however, that the theory of the pre-Roman origin of these ways is confronted by the obvious doubt whether their long and generally direct and undeviating courses through the Island (their most remarkable characteristic) do not indicate that they could have been projected by no other than a homogeneous people, which, so far as we know, was not the character of the tribes who occupied the country immediately preceding the Roman invasion, whatever it may have been in some previous period. On the other hand, if the Romans were their authors, one would expect to find that they formed an important component part of the Roman road-system, which does not appear to have been the case. No ingenuity has been able to dovetail them, except in a very fragmentary manner, commensurate with their apparent consequence, into the fifteen great military ways of the Antonine system. Again: one of these roads, the Icknield Way, certainly retained its British name through Roman to Saxon times; and the original Watling Street did not pass through London, but crossed the Thames farther west, although it was afterwards diverted into its later course through the Roman town—a proof that it existed at least before the time of Aulus Plautius, A.D. 43.‡ The connection of these ways with reputed Celtic hill-fortresses seems to be in many instances strikingly apparent, but the evidence has not been thoroughly worked out. Perhaps the most suggestive fact is this; that whereas, for certain distances, undoubted Roman roads coincide with what are assumed to be British trackways, in the intervals the native way, either disused or avoided in favour of a more direct course, reappears, bearing the peculiar marks of its British origin, and its continuity is found unbroken.§

On the whole, as the pre-historic horizon widens, it becomes apparent that, long before the Roman occupation of

* *Chronicle of Henry of Huntingdon* (BOHN'S ed.), bk. i. 8.

† GEOFFREY'S *British History*, bk. iii. c. 5.

‡ GREEN'S *Making of England*, p. 102 (note). LOFTIE'S *History of London*, 2nd ed. 1884, i. 27.

§ DAVIDSON'S *British and Roman Remains in the Vicinity of Axminster*, 1833, p. 66.

Britain, a network of native roads, or, as it may be better to put it, trackways, must have extended over the whole Island; that the Romans adopted them, or portions of them, for their own purposes; pieced them together, so to say, in continuous lines of two or three hundred miles in length; and here and there converted them into magnificent military roads. In the opinion of the late Dr. Edwin Guest, whose profound archæological insight few will be disposed to question, the Four Great Ways belong to this category.

I shall not perhaps be far wrong in saying that, of all these great ways, the most familiar to the majority of Devonians in connection with their own county, at least by name, is the *Icknield Way*. How this has happened will be discovered in the following remarks.

The Icenhilde—so written in the Anglo-Saxon charters, but more usually spelt, as it was probably always pronounced, Icknield—weg or street is supposed to have derived its name from the Iceni, the warlike people who anciently inhabited Norfolk and Suffolk; and it is, in this respect, unlike most thoroughfares, which take their name from their destination and not from their point of departure. This is generally considered the most ancient of the Four Great Ways, and it is the most difficult to trace, even its remains having been almost obliterated from the face of the country. It is peculiarly unfortunate that the Ordnance maps have no fewer than three Icknield streets.* From the “gwent” or clearing of the Iceni, which afterwards became the *Venta Icenorum* of the Romans (identified with Caistor, near Norwich), the true Icknield Way appears to have passed in a south-westerly direction along a strip of open country that lay between a wide extent of fen-land on the one side and an impenetrable forest on the other, which still existed in the time of the Romans, and skirting the western slope of the Chiltern hills reached the southern border of our present Oxfordshire. “And here,” remarks Gale, who had followed to this point the steps of previous observers, “I must confess myself at a full stop, the *Ikenild-street* as far as I know, being after this intirely lost, and our guides utterly disagreeing among themselves which way to lead us.”† As this author points out, Higden, a chronicler or compiler of early chronicles, who wrote in the fifteenth century, and affected a description of the Four Great Ways, utterly broke down when he attempted to describe the Icknield. A map in an early MS., which

* GUEST'S *Origines Celticae*, p. 233, note.

† LELAND, vi. 138.

formerly belonged to the Abbey of St. Alban's, now in the British Museum (Cotton MSS. Nero D. i.), reproduced by Gale, although a much distorted sketch of the Four Ways, is of some interest in relation to the point which will come under consideration, as it carries on the Icknield Way to Salisbury, which is shown to be its terminus. Beyond this, no further light is given by the mediæval chroniclers.

Following Gale came Dr. Stukeley, an archæologist of the pre-scientific period, whose fanciful speculations are well known. His work, *Itinerarium Curiosum*, first appeared in 1724. Stukeley struck, as he imagined, fresh traces of the Icknield Way through Dorsetshire. But it is clear that what he meant by the *Via Iceniana* was not the British way, but the Roman military road which is followed in Iter xv. of Antoninus from *Sorbiodunum* (Old Sarum) to *Isca Dumnoniorum* (Exeter.) The distinction should be kept in view. So far was the Icknield Way unlike this, that Dr. Guest says that it had been generally and, as he believed, rightly considered as a mere British trackway, and that he had looked for traces of an artificial road along its course, but had not found them.*

Dr. Musgrave, the accomplished antiquary of Exeter, whose work, *Belgium Britannicum*, &c., was published, in Latin, in 1719-20, somewhat anticipated, and, at the same time, advanced upon, Stukeley by conjecturing that the Icknield extended to Exeter, Newton, and Totnes.

After a long interval, in the early part of the present century, the Rev. Thomas Leman, of Bath, whose observations on ancient roads added considerably to the existing knowledge of the subject, and re-awakened interest in it, elaborated a map of the Celtic and Belgic trackways of ancient Britain, in which the "Icknield Street" is seen conspicuously passing through Devonshire and Cornwall to the river Fal.†

Dr. William Bennet, better known as the learned Bishop of Cloyne, whose essay on British and Roman roads and stations in Lysons' *Devonshire* is familiar to most of us, is however mainly responsible, not only for having perpetuated this idea, but for having brought it home to us, so to speak, in a work specially devoted to our own county. It is not without still closer local interest that one of the circumstances which apparently misled him lies near the spot where we are now met.

* *Origines Celticae*, p. 239.

† BRITTON and BRAYLEY'S *Beauties of England and Wales*. Introductory volume, 1818.

According to Dr. Bennet, the British Icknield Way entered Devonshire near Axminster; and passing through that town and Honiton, and making a bend towards Hembury Fort, reached Streetway-head, from which point for the remainder of its course to Exeter it became absorbed in the Roman military road of the Antonine Itinerary. South of Exeter, Dr. Bennet considered that it followed very nearly the line of the modern road by Kennford over Great Haldon as far as Sandygate, a little more than two miles from Newton.* From this point, he says, it bore off from the present turnpike-road, "and, passing by King's Teignton, crossed the Teign below Newton Abbot by a ford still called *Hacknield-way*."†

It may be inferred, from a passage in Mr. Octavian Blewitt's *Panorama of Torquay* (2nd ed. 1832, p. 202), that the idea of this deviation originated with Mr. Thomas Northmore, of Cleve, who communicated it to Dr. Bennet. It is easy to see what was the temptation. Two miles below Teignbridge, on the left bank of the river, there is certainly a place called Hackney; but the road which diverges from Sandygate has no characteristics whatever of an old British way, and is merely a comparatively modern church road, the bourn of which is, evidently enough, Kingsteignton Church; and, secondly, although the name "Hackney" is undoubtedly of considerable antiquity, it is in fact that of a *rock*, popularly known there in the reign of Henry III., 1216-1272, when it was mentioned as a boundary mark in a grant of certain privileges to the town of Teignmouth by the Bishop of Exeter.‡ I am unable to discover any authority, ancient or modern, for the name having been ever applied to the "way." Mr. Blewitt threw a shade of suspicion on Dr. Bennet's reference to it in this sense, which goes far to discredit the bishop's assumption. It is simply the name of a place. There is a famous borough of Hackney in Middlesex, with reference to the name of which Peter Cunningham notes that its etymology is unknown; and as a place-name Hackney also occurs in Somersetshire and in Derbyshire;§ but by no possibility could anyone of these places have had connection of any sort with the Icknield Way, nor, I venture to think, had the Hackney on the Teign.

* The reader is referred to the map which accompanies this paper.

† LYSONS' *Devonshire*, p. cccxii.

‡ Cited in *A Guide to the Watling Places on the Coast between the Exe and the Dart*, &c., Teignmouth, 1817, p. 4.

§ TAYLOR'S *Words and Places*, p. 238. He interprets the suffix *ney* as meaning an island, in which sense, however, it has no significance here.

Here, however, according to Dr. Bennet, the Icknield crossed the Teign, and then "went over Ford-common, and again joined the modern road to Totnes."* Mr. Blewitt amplified this rather unhappy description, but made it scarcely more definite or intelligible;† nor does his amplification become more lucid if we refer to the curiously inaccurate map prefixed to his work, in which, for example, Wolborough church is to be found depicted on Milberdown.

Of course I do not mean to suggest that Dr. Bennet's interpretation of the place-name of Hackney beguiled him into extending the Icknield Way into this part of South Devon; but it undoubtedly led him to adopt a line for his conjectural road which must be regarded as untenable. It is inconceivable that the ancient way, whatever it may be correct to call it, would have been diverted from its direct course at Sandygate for the purpose of passing the river at a lower ford, subject, moreover, to the influences of tides, assuming, as we may well do, that a ford already existed at or near the site of the present Teignbridge.

It is doubtful if there was ever anything more than a merely local ford across the Teign at Hackney; there is no appearance of any connecting road on the opposite bank. I say a local ford, because the parish of Kingsteignton includes a narrow riparian strip on the other side of the river, formerly part of the king's manor, with which the parish no doubt was, as usual, conterminous. But nearly half a mile lower down the stream evidences still exist of an ancient frequented ford, and they are even indicated in the Ordnance Survey, where an archæological fact is a curiosity. This ford has an interest of its own as appertaining to an entirely distinct road approaching it from Exeter, a road apparently of great antiquity and having all the characteristics of a Celtic trackway. I do not know whether it may be taken as an axiom that the lower down the stream the older the ford—perhaps the variety of influences preclude the possibility of any generalization—but in this case it is conceivable that the choice of the lower ford would be naturally made in an earlier period, when the country through which the upper part of the river flowed, being more densely

* LYSONS' *Devonshire*, p. cccxii. There is no such place as "Ford-common" now known. But a piece of waste bordering the roads which unite at the foot of Milberdown was probably meant. If there was implied any connection between the name and the ford of the Teign, it was a mistake. Ford (or Forde) was evidently derived from the ford of the Aller, close by, and not from that of the Teign, which is fully a mile distant.

† *Panorama*, &c., p. 201.

wooded, the river would consequently be more liable at times to sudden overflow. The highly interesting road to which I now refer seems to have been quite unknown to Dr. Bennet. It is first met with diverging from the direct course which it takes for nearly three miles from the ford of the Exe, crossing the little river Kenn a mile below the present Kennford at the site of Beavis Bridge, close to which, in the name of a farm called Kennford, that of an older ford survives. Then, deeply worn in the Triassic rock, it skirts the eastern slope of Great Haldon, and makes for the heights of Little Haldon.

In the grant by Eadward the Confessor to Leofric, in the year 1044, which formed part of the subject of Mr. J. B. Davidson's extremely valuable paper "On the Early History of Dawlish" (*Trans. Devon. Assoc.* xiii. 106), this road is shown to have formed for more than three miles part of the boundary of the lands named in the grant, and it coincided for that distance with the limit of the ancient parish of Dawlish. It is described several times in the deed as the "stræte," and in one, the last, instance as the "port-stræte." Whether, as Mr. Davidson evidently thought, the section thus described was exceptionally so designated may be open to doubt, as the continuity of the road is unbroken. Mr. Davidson interprets it "market-street." The word *stræte* seems to have been applied by the Anglo-Saxons to any main road; Taylor (*Words and Places*, p. 167) says, to a paved road.

On the summit of Little Haldon the "stræte" passed close to the ancient and still conspicuous earthwork which is described in the Anglo-Saxon grant as the "eord birig," and obviously in relation to it. It then descended the hill, where it now bears the local name of Combe's-end lane, to the present farm of Higher Wear. There is a striking fragment which survives above the farmhouse on the other side of the turnpike-road. Passing through this homestead, it crossed the river by the ford above-mentioned, and continued its course behind the present farmhouse of Buckland Baron, and across the road leading from Newton to Marychurch, a little above Pen Inn. From this point a connection with the great Celtic oppidum on Milberdown is discernible. The road is thenceforward identical with that which is cursorily described by Dr. Bennet as passing on its way to Totnes. It is, in fact, to be seen conspicuously climbing the hill south of Kingskerswell, and its course is in a curve by way of Five-lanes, along the northern slope of Beacon Hill, and through

the village of Berry Pomeroy. The high antiquity of this road is confirmed by its distinct relation to the main thoroughfare of the town of Totnes, which runs, not north and south, as the route of traffic in the historical period would have marked out, but east and west. The ancient road, the course of which is still indicated by the name of the hamlet of True Street, a short distance from the town, was in the direct line of this thoroughfare; and, crossing the Dart by a ford where the present bridge stands, it made for the Celtic hill-fort, which doubtless preceded the Saxon buhr and the Norman keep of Judhael on the same site. The road is manifestly older than the town. The highly interesting fragment which ascends Harper's Hill in a southerly direction over Windmill-down is probably an extension of it, but its course is soon apparently lost.

But the question whether or not the Icknield Way passed through Devonshire does not depend entirely upon the soundness or otherwise of the theories of Mr. Leman and Dr. Bennet. There is a striking piece of documentary evidence, which it is impossible to set aside, that the Icknield Way, instead of going to Dorchester and westward after leaving Salisbury, continued in a different direction due south to the coast at or about Christchurch, thus bearing out the popular impression that it extended from sea to sea. In the appendix to an Anglo-Saxon charter, by which King Eadward (901-925) granted the manor of Hordwell, in Hampshire, to the Abbey of Abingdon, the "Icenhelde weg" is thrice incidentally mentioned as part of the boundary of the estate.* This seems to be tolerably conclusive as to the true direction of this disputed road. If it should be urged that this may have been a branch only of the Icknield, I can only reply that, if so, branches may have existed anywhere and everywhere; and then it may be asked, What becomes of the individuality which is one of the characteristics so distinctly ascribed to each of the Four Great Ways both by history and tradition? It is worth remarking that, according to the theory of Mr. Thomas Kerslake, this was the line of the advance of Vespasian with his two Roman legions, A.D. 47.† On the same line is Charford—the Cerdicsford of the *Anglo-Saxon Chronicle*—the scene of a decisive battle in the year 519, when the Britons were defeated by the Saxons under Cerdic and Cynric. The course of the Icknield, which is thus his-

* *Hist. Monasterii de Abingdon*, i. 57, quoted by SEEBOHM, *English Village Community*, 1883, p. 107.

† *A Primæval British Metropolis*, 1877, p. 77.

torically marked out, is that described by Drayton in his *Polyolbion* as passing from the Chilterns—

“Into the dropping South, and bearing then outright
Upon the Solent Sea.”

The Icknield Way was the war-path of the Iceni, as the word seems to import; and dykes which cross it and tumuli which rise on each side of it attest this meaning. If this be the right etymology, it is of course difficult at the outset to understand what the Iceni could have had to do either in war or peace with the Dumnonii, from whom they were separated by probably half a dozen independent tribes. On this point both history and tradition are silent. If, however, we may believe that a commercial traffic was carried on in pre-Roman times between the Dumnonian tinnerns and the people of the inland districts, and that it passed over the lines of ancient trackway, which are still conspicuous, running in undeviating courses along the hillsides through the whole of South Devon, there is no objection to the assumption that one of these arterial roads extended into Dorsetshire. That an ancient British way did precede the military road which connected *Isca Dumnoniorum* (Exeter) and *Durnonovaria* (Dorchester) of the Antonine Itinerary is tolerably certain. It might be looked for, aware, as we are, of the Roman method of adopting existing roads between British towns; but I venture to doubt whether there is sufficient evidence to identify with it the Icknield Way, or, which is in effect the same thing, to satisfy us that the Icknield Way is to be found anywhere in Devonshire.

Dr. Bennet's conclusions, which have remained for more than sixty years undisturbed, have deservedly the weight of a very high authority. I trust that I have not been too presumptuous in regarding them, however, so far at least as they have been here examined, as unsatisfactory. In the course of the further considerations which I propose to offer on some of the ancient roads in South Devon, I shall next enquire what better, if any, reason there may be for determining that the *Fosse Way*, another of the Four Great Ways, passed through that part of Devonshire to which, tacitly, these observations are confined. But neither on this point can the important aid to be derived from the information of the bishop, who made the subject so much his own, be well left out of the account. The subject is not without considerable difficulty. The rival claims of the “sister” roads, as

Stukeley termed them, are so complicated, that the late Mr. James Davidson, who studied them more fully probably than anyone has done, in his last review of the question, was reduced to the expedient of extinguishing those claims in each other, if the expression may be used, when he stated that the *united Fosse and Icknield Ways* passed onward from Exeter to Totnes.*

It was not the Icknield but the Fosse Way which all the early chroniclers always associated with Devonshire. Their description, it is true, belongs to the Homeric period, as it were, of English literature, and has been perhaps, for that reason only, unduly overlooked or altogether discredited. The question however is, whether or not there are any facts or inferences to accord with a tradition which, hazy as it may be, is possibly not without some basis.

The Fosse Way—"the faire old way made by the Britons" of Leland—is mentioned in Anglo-Saxon charters of as early as the eighth century. It would seem that its name was obviously acquired after the time of the Roman occupation; and that whether the Romans found it a sunken way (*fossa*), or fenced it on each side with a ditch, as Camden says men thought in his day,† the name adhered to it. But, strangely enough, on the authority of Kemble, the British word *fos* meant also a ditch.‡ Geoffrey of Monmouth, writing in the twelfth century, states that the intention of its founders was to pave a causeway of stone and mortar which should run the whole length of the island, from the sea of Cornwall to the shores of Caithness. Henry of Huntingdon, his contemporary, reversing the order, says that it began in "Catenes," and ended in "Totenes." Robert of Gloucester, a monkish writer of the thirteenth century, in a rhyming description of the Four Ways, has left an account of it in this version :

"The ferthe of thise is most of alle that tilleth fram Toteneys,
Fram the one ende of Cornwaile anone to Catenays,
Fram the Southwest to Northeast into Englonde ende :
Fosse men callith thilke way, that by many toun doth wende."

Ralph Higden, whose *Polychronicon* was written early in the fourteenth century, repeats the story. The passage in which he refers to the Fosse Way I quote from a translation made by an anonymous scribe in the middle of the fifteenth century, which is printed with the original text in the Rolls series : "The first of whom, and the moste, begynneth in an angle in Cornwaile at Tottenesse, and is extendede in to the

* *Notes on the Antiquities of Devonshire, &c.*, Exeter, 1861, p. 64.

† *Britannia*, p. 64.

‡ *Codex Diplomaticus ævi Saxonici*, iii. xxv.

northe, and terminate in the ende of Scottelonde at Katenesse. Neuerthelesse that weye begynneth more truly, after some men, in Cornewayle, goenge by Deueschire [probably Deneschire in the MS.] and Somerseate," &c.*

Robert Gale, whose learned treatise summarised all that was probably known of the Four Great Ways at the commencement of the last century, remarked that no accounts that he had met with of those western parts (alluding to Devonshire) described the course of the Fosse Way, or even gave any hints which way it might go to *Tottenesse*. Nor was it likely that he would find any such description, for at that time no work specially relating to the archæology of Devonshire had seen the light. Gibson, Horsley, and other antiquarian writers who followed them, treating the Fosse Way as a Roman road, agreed that it passed through Devonshire, but not having apparently any local knowledge, gave no indication of the course which they supposed that it took. A learned and perhaps successful attempt has been made by a recent writer to disestablish the Totnes of Devonshire in relation to some other incidents, historical and unhistorical, and we are assured that the "Totnais," or "Totonys," of the elder chroniclers is not to be confounded with it.† Dr. Guest, without precisely adopting this view, was led to think that from Totnes to Caithness might have been merely a proverbial expression, equivalent to the modern "from Land's End to John o'Groats." Be this as it may, we need not, I think, surrender Totnes in this case, nor be surprised if the geography of the old chroniclers is a little confused; it was no uncommon thing for the name of Cornwall to be applied to the whole of the western peninsula by Saxon writers before Æthelstan's time. There was therefore a respectable and, to all appearance, a genuine mediæval tradition, if nothing more, which indicated the ancient course of the Fosse Way through at least some part of South Devon.

Although it is an old adage, that all roads lead to Rome, the great British ways pointed to no particular centre; there was, in fact, no metropolis, and the whole island was, so to speak, provincial. Leland, in a note to Higden,‡ remarked the concurrence of authorities in the belief that the Fosse Way began in Cornwall, extending through Devon and

* *Polychronicon Ranulphi Higden monachi Cestrensis*, ed. C. Babington, 1869, lib. i. ch. xlv.

† KERSLAKE'S *A Primæval British Metropolis*, pp. 37, et seq.

‡ *Collectanea*, iii. 370.

Somerset, and so on northwards. And Whitaker, the historian of Manchester, with a meaning similar to that implied in Leland's remark, noticed, what he considered as very extraordinary, that the Fosse Way plainly appeared to have *commenced* from the south. What probably passed through his mind was the idea of a pre-Roman civilization in Britain originating in Cornwall, and derived from over sea through the Carthaginians or Phœnicians. Into this question I need not enter; but there is no great inconsistency in supposing that the province which first struck a British coinage may also have first designed a system of roads. And it is not unworthy of note that Belinus, the king to whom Geoffrey traditionally ascribed the construction of the Four Great Ways, is believed by Mr. Beale Poste to have been a real personage, a Belgic Gaul, who lived 350 years B.C., and was prince of Dumnonia—that part of Britain which had the earliest communication with foreigners, and which this author thinks may be judged to have been the first organized state in the island.*

This inference commends itself so strongly that I should have preferred to trace the Fosse Way, so far as it may now be done, in the hypothetical order, namely, from the south. But it will be more convenient to adopt the usual method of following it in the contrary direction.

It is beyond the province of this paper to touch the controverted point whether any traces of the Fosse Way are to be made out northward of Lincoln. But there is no question that the course of this great way, whether it is regarded as a British or as a Roman-British road, south of Lincolnshire, is almost unbroken in its continuity as far as the southern border of Somersetshire. It holds its own on every map of England on a respectable scale to this day. Following a generally south-west course from Lincoln, and passing through Leicester, it crosses Warwickshire in a line almost as straight as an arrow for nearly forty miles; then, avoiding the valley of the Severn, and following the elevated midland ridge of the island, it bears direct for Cirencester; and its course is continued to Bath, three different sections of it intermediately forming the boundary between the counties of Wilts and Gloucester. From Bath it is conspicuous through the county of Somerset, and the place-names still adhering to it of Fostoke, Stratton-on-the-Vorse, Ilchester, Over-Stratton, Stanchester, and Broadway Street, fully identify it. Besides these names, those of more important Roman

* *Britannic Researches*, 1853, p. 224.

military stations situated on it, and which doubtless occupied the sites of previous British settlements, have been recalled, and show the firm grip with which the Romans held this great internal line of communication.

From Watgore, near South Petherton, close to the southern border of Somersetshire, traces of the Fosse Way are few and obscure for the next sixteen or eighteen miles of its supposed course. If the late Mr. Davidson, as one of the results of his painstaking field-work and practical investigation of the ancient roads of East Devon, failed, and he seems to me to have failed, in satisfactorily filling up this hiatus, any merely theoretical attempt to do so might well be deemed hopeless. Mr. Davidson conjectured something like a splitting of the Fosse Way at Watgore into two branches, one of which led by a slight bend to the west over the boundary of the two counties of Somerset and Devon, and the other proceeded through Axminster, and by a sweep reached the point where both branches again united at Honiton. Mr. Davidson was disposed to think, however, that the former of these was the true continuation of the Fosse Way.* The apparent leaning which it makes to Castle Neroche, a Celtic fortress of considerable pretensions, and to Hembury Fort, another stronghold of the first magnitude, is suggestive.

Mr. Leman, evidently influenced by a belief commonly entertained in his time, but now generally abandoned, that Seaton was the site of the Roman station *Muridunum*, supposed that the Fosse Way terminated there. Seaton he referred to, but I am not aware upon what authority, as "the great British port."† Dr. Bennet appears to have been inclined to concur in this view. The two antiquaries, we learn from Lysons, were friends and fellow-travellers. They had gone together on an exploration over the whole course of the Fosse Way from Lincolnshire, and when, after this memorable journey of 300 miles (as they computed), they arrived on the extreme border of Somersetshire, and from Windwhistle Hill looked down over the rich vale of the Axe to the distant Seaton, they too readily saw there, it seems, the goal of a preconceived theory. It must be confessed that this theory has been firmly held by others, and it is still assumed without question by so good an authority as the Rev. Prebendary Scarth. Dr. Bennet, however, was, afterwards, not entirely satisfied as to the site of *Muridunum*, and hesitated between

* *The British and Roman Remains in the Vicinity of Axminster*, 1833, p. 64.

† BREWER's Introduction to *The Beauties of England and Wales*, 1818, p. 61.

Seaton and Hembury Fort; but he was certain that, wherever it was, the Fosse Way led to it, and he thought that, after all, it was not impossible that the Fosse Way might have connected Ilchester and Exeter by a shorter line than through Seaton.* Mr. Davidson came to the conclusion that it distinctly passed onward from Honiton in a south-westerly direction to Exeter; a course which, Dr. Guest remarked, "would better agree with the accounts left us by Huntingdon and Higden."†

Few who have read the erudite and exhaustive paper by our esteemed associate, Mr. J. B. Davidson, "On the Twelfth and Fifteenth Itinera of Antoninus" (printed in the *Archæological Journal*, 1880, xxxvii. 300), will doubt that the much-discussed site of *Muridunum* may now be almost certainly fixed at Honiton. That being accepted, the course of the great military road of the Antonine Itinerary from *Durnon-ovaria* (Dorchester) to *Isca Dumnoniorum* (Exeter) becomes clear, and at the same time it will be observed that it perceptibly leans towards Honiton, as if purposely to strike and fall in with the Fosse Way at that point. Thus most of the outstanding difficulties in determining the probable real course of the British way to Exeter after entering Devonshire are removed.

The Fosse Way seems, after passing under Hembury Fort, to have made direct for the Celtic hill-fortress of *Caer-Wisc*, entering what we now know as Exeter by the line of Paris-street—the same by which the later Antonine road also entered the Roman castrum.

If the course of the Fosse Way, after it passes from Somersetshire into East Devon, is mainly inferential, its continuation southward from Exeter is not less so. It can only be inferred from the tradition which associates its beginning or end with Totnes, and from the fact, which I assume by anticipation, that a Roman road ran from Exeter through Totnes, and, by all analogy, a British way may be supposed to have preceded it. We are not without some material evidences in support of these inferences. The original track-way, after leaving the Celtic fortress of *Caer-wisc*, seems to be revealed in the line of the street which afterwards bisected the Roman *Isca*, and which has survived through all the mediæval and modern life of Exeter—not the comparatively modern Fore-street, but the far more ancient way leading by Stepcote or, as it occurs in old maps, Stripcoat Hill, to the West Gate, as delineated by Mr. Kerslake in his striking

* LYSONS' *Devonshire*, p. cccxv. † *Origines Celticæ*, 1883, p. 226.

paper on "The Celt and the Teuton in Exeter" (*Archæological Journal*, 1873, xxx. 211.) It here crossed the river Exe at what is still called the Old Ford, below the original Exe Bridge built by Walter Gervys in the middle of the 13th century. The next fording-place was that of the Kenn. Hereabouts, at the foot of Great Haldon, there formerly stood two wonderful stones, which Westcote mentions as having been the subject of some "commentitious fancy,"* although they had been removed, it appears, before his time. They were probably all that was left of a cromlech which erst contained the remains of some distinguished Celt who fell by the wayside. The Fosse Way seems to have followed the same course over Great Haldon which the Bishop of Cloyne attributed to the Icknield Way, until Sandygate is reached. From this point, I conjecture, it continued direct to the Teign, after crossing which it passed through the natural gap in the High Week ridge, which, with the well-known persistency of beaten trackways, the modern road still follows to the valley of the Lemon, where Newton now stands. In the older part of this town, which a vaster road system of modern times has drawn away from its primitive centre, there is a relic, I believe, of the ancient way in a back lane which runs behind the main thoroughfare and falls into the present Wolborough-street, a little to the west of St. Leonard's Chapel. The deep, sunken way ascending the shoulder of Wolborough-hill suggests its further course, which I conceive, in its approach to Totnes, was generally the same as that of the old turnpike road from Newton, passing over Bunker's hill, and falling into the still more ancient Port Street just before it passed the ford of the Dart.

There is one obvious objection to the assumptions which I have been making, which has been probably already anticipated, and which I have no desire to evade; that is, that there is an entire absence, in Devonshire, of place-names like those occurring so frequently in Somersetshire, which might have helped to identify the Fosse Way. It is true that there is on the southern side of Haldon, within a few hundred yards of the conjectured course of the way, and connected with it by a trackway, a farm called *Fostiville*. The etymology of the name is obscure, and at first sight I was not indisposed to think that the word might be a survival, in a corrupted form, of one having reference to the Fosse Way; but I do not press the point. An explanation of this incompleteness of the evidence may, however, be suggested. It was surely

* *View of Devonshire in 1630*, p. 220.

something more than a coincidence that the line which marked the limit of the conquest of Ina in the beginning of the 8th century crossed the Fosse Way exactly where the characteristic place-names cease. Those names had already so far crept along its course and become fixed. The next wave of Saxon conquest or colonization, after an interval of some duration, came from a different direction—from the Dorsætas of the East; it was the inroad of a people who were not likely to adopt into their local nomenclature a word which could not have been at any time intermixed with their associations or traditions, and of which perhaps they had never heard. But, meanwhile, the traditions of the ancient way survived in the Welsh Sagas, and were handed on by the chroniclers.

It may now be convenient to enquire what it was that Geoffrey of Monmouth, writing, it will be remembered, in the twelfth century, was really describing when giving his account of the Fosse Way. What he says of its *origin* is probably fabulous, and must be taken *valeat quantum*. But when he descends from the clouds and to details, his description suggests that he personally knew something of the actual road as it existed in his own time. This suggestion arises from his statement, which it seems unlikely that he would otherwise have invented, that the road was *paved*—"a causeway of stone and mortar." This is just such a case as that where a genuine fact, familiar to everyone when it was mentioned, is embedded in, say, a forged charter, and, designedly or not, helps to build up the consistency of the text, nay, strengthens it. May it not be conjectured, therefore, that Geoffrey was describing a paved causeway which in reality was *Roman* work? Dr. Stukeley, in the last century, found remains of such a pavement on the Fosse Way near Ilchester. "It is composed," he states, "of the flat quarry stones of the country, of a good breadth, laid edgewise, and so close that it looks like the side of a wall fallen down, and through the current of so many ages is not worn through."*

This leads me to examine next what is the evidence which we possess of the existence of Roman roads in South Devon, or, at least, in that part of it to which I limit these observations. I will do so as briefly as possible, though at the certain risk of the tedium which may attend upon a journey over an already twice-travelled track.

It is notorious how little is really known of Roman Devon south of Exeter. A few sporadic deposits of coins—the most

* *Itin. Cur.*, 2nd ed. 1776, i. 155.

fallacious of indications of any actual settlement of the imperial people, Roman money having been probably in circulation long after the last Roman had left the island; no remains of domestic buildings; no vestiges of sepulchral monuments; few traces of actual military occupation. As the Bishop of Cloyne summed up almost plaintively, with reference to the county generally, "A few insulated camps with no remains in them, and detached pieces of road (the end and beginning of which are equally unknown) form the sum of its Roman antiquities and of the stations and cities which it once contained."* It is a plausible conjecture that Dumnonia, as early as the first century, became a tributary state under its own native princes, overruled by the iron hand of Rome; but that the relations which existed between the Romans and the subdued inhabitants of the western peninsula were peaceable and commercial.† Authority was not severely repressive, and no Hadrian, Antoninus, or Severus needed to build a wall from shore to shore to repel hostile incursions. This assumed to be the case, it would be less surprising if we failed to find any vestiges of distinctly marked military roads intersecting the more remote parts of this county. It is not improbable that the theory may derive some support from the indirect evidence which will be contributed by such facts as it may now be possible to bring to notice.

The Itinerary of Antoninus, which has preserved for us a general view of the great roads in Britain at a period supposed to be not earlier than a century after the Claudian conquest, is to be considered only as a military guide-book, and the roads those by which the military communications were kept up. Hearne, the antiquary, lamented that the work had suffered "from the iniquity of time and the mischiefs following from ignorant scribes," and suspected that considerable passages had been omitted in the transcripts known to him. Whether it is from this cause, or that the record, as it survives, only gives a view of the internal means of communication used by the Romans down to a certain time, or that it admitted only such as were of the highest military consequence, it is unquestionable that besides the roads known through this famous compilation, there were others, showing at this day unmistakable traces of their Roman construction, which are not mentioned in it at all. The Fosse Way, for instance, shows undoubted signs of having

* LYSONS' *Devonshire*, p. cccxxiii.

† BEALE POSTE'S *Britannic Researches*, 1853, pp. 17-19.

been one of the Roman highways through Somersetshire; but this part of it is not to be found in the Itinerary. The absence of roads from the Itinerary is, therefore, no warrant for an assumption that they did not exist.

Isca Dumnoniorum, at the termination of the great road from *Calleva* (Silchester), and obviously a military station, was the last post of the Antonine system in Devonshire. That this place was the predecessor of the later Exeter—long held to be an open question—is, I am aware, still doubted by some sceptics among us; but it is enough for me that a consummate master of early English history, Mr. Freeman, has said that “the identity of the British *Caer-Wisc*, the Roman *Isca*, the English Exanceaster, is witnessed by a crowd of authorities.”* To conjecture what Roman highways lay beyond this, there is nothing for us but to peer into the darkness of pre-historic geography, with the help of such gleams as we may get from the uncertain light of Ptolemy or of his follower, the anonymous Gothic Geographer of Ravenna. What we learn from those ancient authorities I shall presently notice.

Meanwhile, if we may believe the teaching of the several writers who have dealt with the subject, little room remains for further conjecture; for their ingenuity has supplied numerous so-called Roman roads intersecting the northern part of Devonshire, or radiating north, west, and south, from Exeter. For the existence of these, or of most of them, the evidence is, to say the least, inconclusive. One of these roads, for example, has been conjectured to pass into the north of Devon on no better ground than the fancied etymology of the names of Chumleigh and Romansleigh; and so lately as in 1875, in a map illustrating a paper by Mr. N. Whitley, F.M.S., printed in vol. v. of the *Journal of the Royal Institution of Cornwall*, Romansleigh is figured as a Roman station. But it may be seriously doubted if “Chumleigh” is a corruption of *Chemin-leigh*, and it is certain that “Romansleigh” derives its name from the British saint St. Rumon, to whom its church is dedicated. Mr. R. D. Blackmore, in his latest Devonshire novel, *Christowell*, has brought us acquainted with a Roman road crossing Dartmoor. But this is not all. I regret to see that in the maps which illustrate the late Mr. J. R. Green’s truly valuable work, *The Making of England*, there is represented a wholly imaginary ancient road, inferentially existing in the time of the Romans, leading straight from Taunton to Stratton, and another converging on the same point from Exeter. It may be

* *Archæological Journal*, xxx. 307.

doubted if there is any better authority for this delineation than Dr. Borlase's amusing description of his discovery of Roman roads from the top of the church tower of Stratton, when, as is generally understood, he was the victim of a mistaken etymology of the name of the place. It is of course fatal to some of these ingenious speculations that they have been founded on the spurious work, *De Situ Britanniae*, attributed to Richard of Cirencester.

Roman remains in the north and west of Devon are even more scanty than in the south of the county. This absence of the monuments of the Romans in Devonshire shows, Mr. Green thought, that large tracts of country lay practically outside the Roman life.* It is difficult, however, to suppose that the Romans, during the three and a half centuries and more of their occupation, had no footing in North Devon, when no farther off than in Somersetshire, as the rich and abundant remains of their civilization in that county bear witness, they were firmly established. However this may have been, it is worth remarking that the chief and most ancient town in North Devon, if not Roman, was laid out on the Roman model, with the cross streets, the four gateways, and the walls of the regular castrum. The Roman, or Romano-British, roads, which are supposed to have penetrated the district, have been made known to us rather in the study than in the field, where they have not been very successfully made out. They were probably, where they existed, merely adaptations of native trackways, passing through what it is the custom to consider a track of woodland, swamp, and waste. Roads of this description were of course very different from the military ways; what these were we are at no loss to conceive, for the Latin writers have left accounts of the method of their construction in the minutest detail. I am not aware that any vestige of such a structure has been shown to exist in Devonshire, north or west of Exeter.

In the Dumnonian peninsula, according to the geography of Ptolemy, there were some shadowy Roman ports or towns, of which we now know no more than the names. Their respective latitudes and longitudes were actually determined by that geographer; but this branch of geographical science was then in its earliest infancy and, from the data, no identification of the precise position of these places has been found possible. It is so far certain, however, that they had a reputed existence. It is probable that they were merely trading ports, developed by the tin trade, and that they were

* GREEN'S *The Making of England*, p. 5.

scattered along the southern shore on the estuaries of the rivers; the more probable as the Dumnonians were, thus early, a maritime people, and their young men were accustomed to serve in foreign fleets.* The least nebulous of these towns is *Tamare*—the *Tamaris* of the geographer of Ravenna, who adds some others which are presumed, from the position in which their names occur in his list of Romano-British settlements, to have been in this part of the island. It is almost obvious that *Tamare* was somewhere on the estuary of the Tamar, as the Romans did certainly transmute in this way the native names of rivers.

Thus a line of communication connecting *Isca* (Exeter), the farthest fully identified Roman station, with these places might reasonably be looked for; and what course would it be so likely to take as that which has been almost invariably taken in later centuries—on the southern side of Dartmoor, by way of Newton and Totnes? I think it may be shown that this was the case.

Mr. J. B. Davidson has observed that the present great road from Honiton to Exeter bears the marks of its origin, and "the stamp of military road-making on an imperial scale."† At Streetway-head, or near it, the remains of the actual Roman causeway were visible in the middle of the last century. From the east gate, where the military road entered the Roman *Isca*, to the west gate, which opened directly on the ford of the Exe, it formed one of the cross streets of the castrum. It has been stated that the Romans did not build bridges across rivers through which a man could wade. But the Roman hold upon the already beaten trackway, which may be assumed to have stretched away over the Haldon hills into the heart of the territory of the Dumnonii, was not likely to rest with the possession of even the defensible ford. The fragment which has been preserved of the Pentingerian table, said to be the oldest map in the world, containing a rough chart of Britain in the 3rd or 4th century, is supposed to show a main road issuing from the Dumnonian *Isca* in a southerly direction, and its evidence has been considered to give almost the only support to the theory of the existence of a Roman road extending thence into Cornwall.‡ There is not much weight, however, in this evidence; the map is probably genuine, but the interpretation of its meaning is open to doubt. It will, of course, be more

* ELTON's *Origins of English History*, 1882, p. 236.

† *Arch. Journal*, xxxvii. 314.

‡ ELTON's *Origins of English History*, p. 346.

to the purpose if it can be shown that the identification of the actual remains of the Roman way is possible.

The "stræte" or Port Street which, as I have stated, takes rather a circuitous course after passing the Kenn and then crosses Little Haldon is, demonstrably, of high antiquity. It is believed that there are nine Port Ways in different parts of the kingdom,* it is probable that there are many more; and the Bishop of Cloyne laid it down that the name infallibly indicated a Roman road. Although the Port Street has no characteristic Roman aspect, and is, I believe, unquestionably Celtic, I am far from asserting that it may not have been used by the Romans; but it must have sunk into insignificance after the time when a more direct road, with pretensions to military importance, was constructed and carried across the Teign higher up the stream.

In proceeding to trace the remains of this Imperial way from its starting-point at the ford of the Exe along the line of the presumed Fosse Way, we cannot do better than again take Dr. Bennet as our travelling companion, at least so far as he is able to guide us. Writing at the beginning of the present century, and evidently from personal observation, he says, "It [the Roman road] is quite plain even at this day in the ascent to Haldon to the right of the present turnpike-road; but just beyond the road leading from Mamhead to Sir L. Palk's crosses that road and continues on the left, being often seen in this direction at intervals, by Newton Bushell to Totnes."† I have identified the highly-interesting traces thus described in this present year. I think the most impressive of the remains of this road are to be seen in descending the hill through the wood from Ugbrooke towards Sandygate, where it is now a disused portion of the old turnpike-road. The characteristic ditch on each side is well preserved. Here, for a mile and a quarter, the road forms the boundary between the parishes of Kingsteignton and Ideford. From Sandygate it goes direct to Teignbridge, retaining marked evidences of its original breadth, notwithstanding the encroachments of the contiguous enclosures, and of its bold, distinctive course.

At Teignbridge we come upon a very important and interesting link in the chain of evidence. It is not known whether Dr. Bennet made his observations before or after the year 1815. But he was clearly unaware of the extremely pertinent discovery made at the time of the re-building of Teignbridge in that year, a perspicuous account of which,

* TAYLOR'S *Words and Places*, 3rd ed. 1873, p. 186.

† LYSONS' *Devonshire*, p. cccxiv.

written by Mr. P. T. Taylor, was communicated to the Society of Antiquaries by Mr. Samuel Lysons in 1818, although it was not printed in the *Archæologia* until 1821, the year after Dr. Bennet's death.

The bridge of two arches, taken down in 1815, was of no great age, and had been built in a singular manner upon two broken arches, at their springing, of a previous bridge of five arches built of red sandstone. Two of the arches of the red sandstone bridge remain entire, buried underneath the road. This bridge can be easily identified, from the excellent illustrations which accompany Mr. Taylor's paper, as the work of the end of the 13th or of the beginning of the 14th century, which appears to have been the great age of bridge-building in Devonshire. The piers of this bridge were found to have been raised on still earlier piers, built of "fine white freestone . . . ashlar laid," and they rested on a framework of oak, which Mr. Taylor says was "probably the basis of a wooden bridge in use prior to the building of the red bridge, and the places where upright pieces had been mortised to these frames were visible. . . . The timbers were from seventeen to twenty-four inches square."* Mr. Taylor, who disclaimed somewhat unnecessarily any pretension to be an antiquary, supposed the wooden bridge to be as old as the Conquest, and the white stone bridge to have been a Roman work. He was apparently not aware that the composite structure, a timber framework on stone piers, was really the most common form of the Roman bridge. Such was Trajan's famous bridge over the Danube, as it may be seen represented in sculpture on his column at Rome. I see no reason to doubt that this composite bridge was the identical one which was certainly in existence before the Norman Conquest, as we know that it gave its name to the hundred. Besides the evidence which the structure itself affords, its connection with the Roman road which has been shown to have led up to it, supports the theory of its Roman origin. The bridge and the road bear witness to each other. A section of the roadway, where a temporary channel had been made for the river during the re-building of the bridge, revealed two previous paved causeways and the remains of a still lower one, corresponding with the earliest bridge, six feet below the surface of the meadow. This causeway appears to have been from ten to twelve feet wide. Mr. Taylor adds, that when the present causeway was widened, about the year 1812, pavements and traces of old buildings were everywhere found.

* *Archæologia*, xix. 310.

Before giving such practical observations as may now be possible on the further course of the Roman way, after it crossed the Teign and its alluvial valley by the bridge and causeway, I shall quote two early notices of it, one of which is by Dr. William Musgrave, who was the first to discover, or at least to make known in his work *Antiquitates Britanno-Belgicae, præcipue Romanæ*, published in 1719, the existence of the traces of this road. He thus describes the extension of what he designates the military way beyond Exeter:—From the ferry of the Exe to Kennford, and thence ascending the hill now called Haldon to Ugbrooke, to the river Teign, to Newton, to Totnes, in which last-named interval the *via* to-day stands up so prominently that rarely does it any where more so. (“Post Iscæ Fluvii trajectionem, ad Kenn-ford, et dein, superato monte nunc Halden nuncupato, ad Ugbrook, ad Teignum fluvium, ad Neapolin (Newton), ad Totonesium; quo stadio, novissime dicto, hodieque eminet Via, sic, ut raro usquam magis.”) In many journeys Dr. Musgrave had carefully examined and noted the evidences of a Roman way extending from Bath (*Aquæ Sulis*) through Somersetshire in the direction of Exeter, and, struck by the notorious absence of this road from the Itinerary of Antoninus, he suggested this as a conjectural *Iter* in the familiar form to be found in that compilation:—

AB AQUIS SOLIS.

ABONEM	MP VIII . . .	Hanham.
TRAJECTUM	MP XII . . .	Oldbury.
ISCHALIN	MP XXVI . . .	Ilchester.
AXIUM	MP XVI . . .	Azminster.
ISCAM DUNMONIORUM	MP XXII . . .	Exeter.
NEAPOLIN	MP XIII . . .	Newton Bussel.
TOTONESIUM	MP VIII . . .	Totnes.*

The next account which we possess is from the personal observation of a Mr. Moulding in the year 1743. It gives a description of the remains of the Roman way before the introduction of turnpike-roads—the more valuable, it may be remarked, because the new system of road-making had probably much to do with the effacement of the original Roman structure. It is given by Borlase:† “The Roman road is visible at Kenford (about three miles below Exeter); there are not bolder remains in the kingdom of such ways than from the passage over the Exe through Kenford and Newton Bushel to Totnes. It appears with a high crest,

* *Op. cit.* i. 74–78.† *Antiquities of Cornwall*, p. 332.

and entire most part of the way, which is at least twenty miles; I travelled twice along it." All this may now seem very difficult of verification. The "crest," as the old antiquaries termed it, of the Roman road, raised many feet above the natural surface of the ground with elaborately disposed materials, became in after centuries a ready and valuable quarry; but during the last century and a half specially destructive agencies have been at work. Hutchins, the historian of Dorset, when complaining of such results with reference to a similar bygone relic in his own county, in a neatly-worded sentence thus deplores its ultimate fate: "It was unfortunately too near a modern turnpike road; the surveyors observed it with an evil eye, and, for the sake of the materials, destroyed a work which they could not emulate."* However, it can scarcely escape the observer who looks for them that fragments of a deep ditch, or hollow way, occur at intervals by the side of the road from Newton all the way to Totnes, with more distinctness by the side of those parts of the old road over which the modern turnpike-road was not carried. They are a favourite habitat in spring-time of the earliest and finest primroses, and, at all seasons, in their shady and damp recesses ferns display their most luxuriant fronds. Such a ditch, on one side only or on each side, is the usual accompaniment of the remains of the raised Roman road. Probably the best preserved traces of the original Roman structure are to be found on the northern and southern slopes of Firestone-hill and on the ascent of Bunker's hill, a little to the south of Gatcombe.

A branch road, having unmistakably the same peculiarities, appears to have been thrown off on the left hand side from the main road on Firestone-hill, about one mile from Newton, which passed through the present villages of Abbotskerswell and Compton, and crossed the Port Street at Five-lanes, going to Brixham or Kingswear. As depicted in Ogilby's road-book of 1675, it is part of the direct road from Dartmouth to Minehead.† It was over these two roads, converging before they crossed the Teign at Teignbridge, that during the middle ages the traffic between Dartmouth and Totnes, respectively, and Exeter undoubtedly passed. And so it had probably been in the time of the Romans, centuries before.

It is not suggested that Newton, or, as perhaps I should rather say, the Newtons, were settlements in the period of the Roman occupation. Like the many other *Nyvatons* of

* *History of Dorset*, 1774, i. xiii.

† *Itinerarium Angliæ*, first ed. fo. 66.

the *Domesday* book, their name bespeaks their Saxon, and probably late Saxon, origin. No Roman remains, so far as I know, have been discovered in the modern Newton; although in the last century, when the wild guesses prompted by the confusion in the text of the twelfth Itinerary of Antoninus were in fashion, it came very near to the distinction of being claimed by an enthusiastic antiquary as the site of *Leucarum*.^{*} We have seen that Dr. Musgrave gave it the supposititious Latin name of *Neapolis*.

On the whole, it may be considered to be not improbable that Teignbridge was the farthest point to which the Romans had completed their strictly military way in this direction; because to this point the road from Exeter had, so far as may be determined from its remains, the characteristic rigid and decided aspect of the roads over which the legionaries were accustomed to march. The evidence of miliaries, or Roman mile-stones, in various parts of the country, seems to show that the great period of Roman military road-making was in the first half of the second century. The unique evidence of this kind which has been found in Cornwall is of nearly two hundred years later date, which may be significant of a pause of considerable duration in the extension of the system westward. The long causeway must have been an important element in the defence of the position on the Teign. One would like to have known more of the "old buildings," the remains of which were found on it, we are told, in 1812. It was here that Baxter all but placed the *Stena*, or *Stene*, of the Ptolemaic geographers: "Videtur," he says, "hæc esse Teignton in litore Dumnoniæ. Quid autem *Stena* nisi *Isc tene* sive *Tenuis aqua*, qualis scilicet fluviolus Teign est, sive *Tenisca*?"[†]

Beyond the valley of the Teign the road unmistakably takes a different character, and is less pronounced. The Roman engineers may have been baffled by the nature of the country, which is not likely; but the road follows the devious, winding, and irregular course which is more characteristic of a British trackway, as if it were an adaptation of such an earlier way rather for commercial than for military traffic. This I have already remarked as an inference only in favour of the existence of the pre-Roman Fosse Way. The remains of outlying Roman camps, one on Milberdown (above the Celtic oppidum), and another in Holne Chase, which are copies of each other, may have been those of

^{*} N. SALMON'S *New Survey of England*, 1729, ii. 837.

[†] *Glossarium Antiquitatum Britannicarum*, 1719, p. 220.

castra aestiva—summer camps, or of mere temporary halting-places in connection with this outpost.

I forbear to examine the evidences of ancient roads south of the latitude of Totnes, because I have not had an opportunity of sufficiently studying them, and because the limits of this paper have been already sufficiently extended. Dr. Borlase believed that he had discovered traces of a Roman road passing through the whole of Cornwall. More recently it has been attempted, but with indifferent success, to verify these remains. The famous inscribed stone of the fourth century found at St. Hilary, near Penzance, in the year 1853, which has been fully described by Dr. Barham,* and which Baron Emil Hübner, the European authority on Roman inscriptions, has pronounced to be without question a Roman miliary, is, of course, evidence of the greatest significance. The stone may have been a solitary mark of the limit of the Imperial dominion in the far West, and not one of a series; but, in either case, the end of course implies a beginning. The bearing of the evidence on what has gone before is just this, that it seems to show, conclusively, that there was a continuity of the Roman highway from the point at Totnes where I left it. The actual traces of the road, however, have yet, I believe, to be discovered.

* *Journal of the Royal Institution of Cornwall*, v. 366.

KENT'S CAVERN AND GLACIAL OR PRE-GLACIAL MAN.

BY WILLIAM PENGELLY, F.R.S., F.G.S., ETC.

(Read at Newton Abbot, July 30th, 1884.)

THE *Ninth Report of the Committee for Exploring Kent's Cavern, Devonshire* (*Rep. Brit. Assoc.*, 1873, pp. 198-219), directed attention to the facts that the Cavern contained two *Palæolithic* deposits, widely separated in time, and termed respectively the *Cave-earth* and the *Breccia*; and that while the *Cave hyæna* was represented abundantly and in a variety of ways in the *Cave-earth*, or less ancient deposit, not a single trace of his presence or existence had been found in the *Breccia*, or more ancient. The Report then went on to say "When the Cavern-haunting habits of the *Hyæna* are remembered, it can scarcely be unsafe to conclude from the absence of any trace of him in the *Breccia* that he was not an inhabitant of Britain during the era of that deposit. The same argument can by no means be applied with equal force to the Horse, Ox, Deer, &c., whose absence is equally pronounced; for it may be presumed that their bones occur in Caverns, at least mainly, because their dead bodies were dragged there piecemeal by the *Hyæna*; and this could not have occurred before his arrival. The *Ursine* remains met with in the *Breccia* present no difficulty, as the Bear, like the *Hyæna*, is a *Cave-dweller*.

"The fact that though he was not a member of the British fauna during the era of the *Breccia* he had become very prevalent during that of the *Cave-earth*, may probably be taken as indicating that after, but not during, the period of the *Breccia*, Britain was a part of continental Europe, and thus rendered his arrival possible. If this be admitted, it follows that the early men of Devonshire saw this country

pass from an insular to a continental state, and again become an island." (*Op. cit.* 209.)

While readily admitting that, as the "Reporter," I am alone primarily responsible for the words just quoted, as well as for the ideas they contain, it may be added that the Report, before its presentation to the Cavern Committee preparatory to its going forward to the British Association, was read in its entirety to Mr. E. Vivian, my brother Superintendent, who not only endorsed the Report as a whole, but expressed definitely his entire approval of the paragraphs just quoted, remarking that the full significance of the absence of the Hyæna had not previously occurred to him.

From the era of the Ninth Report (1873), to that of the Sixteenth and last (1880), the excavators were almost every day working in the Breccia, which remained silent to the last respecting the existence of a contemporary Hyæna, and I had in the meantime repeated again and again my conviction that it had been possible for the *Hyæna spelæa* to reach Britain between the period of the Breccia and the period of the Cave-earth.

Thus, in a Paper on *The Flint and Chert Implements found in Kent's Cavern, Torquay*, read to the Plymouth Institution, 18th February 1875, and published in the *Transactions* of that body (v. 341-375), I directed attention to the fact that, according to Sir C. Lyell, Britain was in a continental state immediately before the Glacial era, the climate was somewhat milder than at present, and the famous "Forest of Cromer" flourished.

That this was followed by a period of submergence, when the land north of the Thames and Bristol Channel was reduced to an archipelago, and icebergs floated in British waters.

That a second continental period succeeded; when glaciers occupied the higher mountains of Wales and Scotland.

That finally a second, but less pronounced, submergence, and a gradual change of temperature, produced our present climate and distribution of land and water.

The interpretation I then put on the Kent's Cavern facts was, "That the Hyæna first reached Britain during the last continental period, but that man occupied Devonshire prior to that. It must be unnecessary to say that if this be accepted it will follow that unless the earliest Devonshire men of whom we have at present caught sight possessed some means of navigation, they must have arrived here during the first continental period; and that to this

conclusion we must also be driven if, as seems probable, Devonshire participated to any considerable extent in the great inter-continental submergence. In other words, the men of the Ursine [= Breccia] period of Kent's Cavern were either of glacial or, more probably, of pre-glacial age." (*Op. cit.* 365.)

Turning from the geographical evidence to the palæontology of Cromer Forest as compared with that of the Cavern Breccia—assumed in the argument to be contemporary—I remarked, on the authority of Professor Boyd Dawkins, "It is satisfactory to find from the foregoing list" [of 26 species of Mammals], "that the Forest bed of Cromer, like the Kent's Hole Breccia, *does* contain remains of Bears, including the *Cave bear*; and that the two deposits agree also in neither of them having yielded any relics of the *Hyæna*. So far therefore as Palæontology can throw any light on the question it is decidedly to the effect that if the Kent's Hole Breccia was deposited before the second continental period, it is not to be expected that remains of *Hyæna* will be found in it." (*Ibid.* p. 366.)

In the Address I was called on to deliver on 20th September 1883 to the Anthropological Department of the British Association, during the meeting at Southport, I followed the same line of argument and adhered to the same opinion, remarking, by way of justification, that "no adverse fact or thought had presented itself to me during the interval." Indeed, as I pointed out, my argument had apparently been much strengthened by the facts that a Monograph on the *Vertebrata of the Forest Bed Series* was published in 1882, by Mr. T. E. Newton, F.G.S., showing a list of 49 species of identified Mammals, as against the 26 species in Professor Boyd Dawkins's list of 1874; and that it continued to be the fact that no trace of *Hyæna* had been found in the Forest bed.

In my Southport Address I remarked "that no relic or indication of *Hyæna* was met with in the 'Fourth Bed' of Brixham Windmill-Hill Cavern, believed to be the equivalent of the Kent's Hole Breccia;" and I went on to say, "It cannot be necessary to add that while the discovery of remains of *Hyæna* in the Forest bed of Cromer, or any other contemporary deposit, would be utterly fatal to my argument, it would leave intact all other evidence in support of the doctrine of British Glacial or Pre-glacial Man"—words which are little more than the echo of a passage in my Plymouth Paper already referred to. (*Trans. Plym. Inst.* v. 366.)

On the 30th September, 1883—the tenth day after reading the Address at Southport—I received a letter from a lady at Norwich, stating that the *Geological Magazine* for October would contain some new facts bearing on my statement respecting the Cromer Forest fauna. The Magazine reached me on 6th October, and shall now tell its own story.

An article entitled "On the Occurrence of the Cave Hyæna in the Forest Bed, at Corton Cliff, Suffolk," By E. T. Newton, F.G.S., appeared in *The Geological Magazine* for October, 1883 (2nd Decade, x. 433-5), and contained the following paragraphs:

"During some excavations which have lately been carried on by Mr. J. J. Colman, M.P., at Corton Cliff, Suffolk, a number of Mammalian teeth were dug out of the 'Forest Bed,' and these specimens, at the suggestion of Mr. James Reeve, of the Norwich Museum, Mr. Colman has very courteously allowed to be sent to me for examination and description.

"A few teeth of *Rhinoceros Etruscus* and of *Cervus* accompanied the series of four upper teeth of *Hyæna* which form the subject of the present communication.

"These teeth include a left upper canine, and the second, third, and fourth upper premolars of the right side. . . . The teeth are in a very perfect state of preservation, but the points of all the cusps have been worn down to flattened surfaces, as is usual with *Hyæna*'s teeth that have been in use for some time.

"A comparison of these teeth, with those of the Cave *Hyæna*, leaves no doubt as to their specific identity.

"Fortunately there is no doubt in the present instance as to the horizon from which these teeth were obtained. The foreman of the works, Mr. W. Spurgeon, is positive as to the teeth having been dug out of the clay at Corton Cliff, and my colleague, Mr. J. H. Blake, who knows the beds of this locality so well, has no doubt as to the clay in question being the 'Forest Bed,' and the teeth themselves have the colour and mineral condition of fossils from this horizon."

It is probable that my friends may now be inclined to ask:

1st. Was it not somewhat rash to assume that a deposit—the Forest bed, for example—contained no relics of a specified

animal because no such relics had been found in it up to a definite time?

2nd. Was it necessary to admit that the discovery of remains of Hyæna in the Cromer Forest bed would be utterly fatal to the Kent's Cavern evidence of the existence of Glacial or Pre-glacial Man in Devonshire?

3rd. If the Hyæna existed in Devonshire during the deposition of the Breccia of Kent's Cavern and the, as is supposed, contemporary "Fourth Bed" of Brixham Windmill-Hill Cavern, how is the absence of any traces of him in these deposits to be accounted for?

I propose now to consider these questions in the order in which they stand.

1st. According to Mr. Newton's Monograph, already cited, the Forest bed series of deposits have for many years attracted the attention of geologists on account of the large Mammalian remains it has yielded, and which have been described, amongst others, by Mr. H. Baker as long ago as 1745, Mr. R. Taylor in 1822, Mr. S. Woodward in 1833, and Professor Owen in 1846. Very large and valuable collections of the relics have been made by Mr. J. Gunn, Rev. S. W. King, Mr. A. Savin, Mr. R. Fitch, Dr. Crowfoot, Mr. E. T. Dowson, Mr. W. G. Sanford, and many others; and some of these collections have been studied and described by eminent palæontologists, including Professor A. Leith Adams, Professor W. Boyd Dawkins, and Dr. H. Falconer. Moreover, the coasts of Norfolk and Suffolk have been systematically surveyed by distinguished officers of the Geological Survey of England and Wales, who, having also collected largely from the Forest bed, completed their labours not later than the summer of 1882 (*op. cit.* 1-4).

Few districts, it is probable, have commanded the attention of so many distinguished men for so long a time; and yet not one of them during the entire period from 1745 to 1882 appears to have detected or suspected a trace of Hyæna among the crowd of Mammalian relics which had been disinterred.

If ever negative evidence was to be used as the basis of a provisional conclusion, it appeared to me that it might be so used in the instance before us. At any rate, I had ventured thus to employ it; several learned professors had admitted to me that in their opinion my argument was a very strong one; and it was not until October, 1883, that it was announced that the spell of nearly a century and a half had

been broken by digging out four teeth of the Cave-hyæna. How many may follow it is of course impossible to say; but Mr. Newton, writing me on 18th October, 1883, says, "Information has just reached me of further specimens from the same locality."

This, however, is a matter of no moment. The Cromer Forest bed has utterly failed me, and almost as soon as I became aware of the fact, I wrote and sent off two or three lines, as a Postscript to my Address, directing attention to the Article in the *Geological Magazine*; and I have the satisfaction of stating that the said P.S. is appended to the Address in the British Association volume for 1883. (See *Rep. Brit. Assoc.*, 1883, p. 560.)

It must be borne in mind that my conclusion was obviously a provisional one only, made with the full recognition of the possibility of such a discovery as the *Geological Magazine* has just told us has at length been actually made, and followed ungrudgingly by a statement of the effect which, in my opinion, such a discovery would have on my argument.

2nd. When stating "that the discovery of remains of Hyæna in the Forest of Cromer, or any other contemporary deposit, would be utterly fatal to my argument, I assumed tacitly that during the entire first continental period, in which the said Forest grew, Britain as a whole was part of the continent. If, however, it be assumed that the Hyæna, travelling from what is now the mainland of Europe, arrived in East Anglia so late in the first continental period that the subsidence which finally reduced Britain to an archipelago had begun; that the South of England, including Devonshire, had become insular before his arrival; and that the Breccia was lodged in Kent's Cavern either before or during the insulation, all the facts of the Forest bed at present known to me, as well as those of the Cavern, will be satisfied.

It will be remembered that in the recital already given of Sir Charles Lyell's published statement of the geographical changes Britain underwent between Newer Pliocene and Historical times, it was said that the first continental period was followed by "a period of submergence, when the land north of the Thames and Bristol Channel, was reduced to an archipelago." The author is silent about the land south of the Thames and Bristol Channel, and the reader is left in uncertainty as to whether Sir Charles was in possession of evidence that the South of England was not submerged, or whether he was without any facts on which to

base an opinion on the question, one way or the other. There can be no doubt, however, that the ordinary reader, taking the text as it stands, would conclude from it that the South of England was an island throughout the great submergence; and this is in harmony with Sir C. Lyell's "Map of the British Isles and part of the North-west of Europe, showing the great amount of supposed submergence of Land beneath the Sea during part of the Glacial Period" (*Antiquity of Man*, 4th ed. 1873, p. 325), in which the whole of the South of England, from a line drawn due west from the North Foreland, is represented as one unbroken island.

It is not my intention to express any opinion for or against the correctness of the hypothesis represented by the map just mentioned; nor am I prepared to say more of the assumptions just sketched than that they are not inconsistent with any fact known to me; that in the question of the insularity of the South of England they are in perfect harmony with Sir C. Lyell's well known Map; and that if, instead of *assumptions*, they were *established facts*, it would not be necessary to admit that the discovery of remains of Hyæna in the Cromer Forest *would* be fatal to the Kent's Cavern evidence of the existence of Glacial or Pre-glacial Man. In short, all that would be required would be to substitute the word "Devonshire" for "Britain" in the first of the two "Inferences in my Southport Address," to enable me to re-express my belief.

1st. "That the Hyæna did not reach *Devonshire* until its last continental period."

2nd. "That the Men who made the Palæolithic nodule-tools found in the oldest known deposit in Kent's Cavern, arrived during the previous great submergence, or, what is more probable—indeed, what alone seems possible unless they were navigators—during the first continental period. In short, I have little or no doubt that the earliest *Devonians* we have sighted were either of Glacial or, more probably, of Pre-glacial age."

The following facts show that the eras of the Breccia and the Cave-earth of Kent's Cavern were widely separated in time:—

A. When the two deposits occurred in the same vertical section, as was commonly the case, the Cave-earth invariably overlay the Breccia.

B. The two deposits were very dissimilar, the Breccia being essentially a dark-red sandy paste containing a very large number of subangular and rounded fragments of Grit of the

same colour, which, though derivable from adjacent loftier eminences, the Cavern hill could not supply. The Cave-earth, on the other hand, was made up of a light-red clay—in all probability the insoluble residuum of the Limestone of the district—with small angular fragments of Limestone.

C. The two deposits were separated by a sheet of Crystalline Stalagmite, very nearly twelve feet thick in one instance, formed necessarily after the Breccia was deposited, but before the deposition of the Cave-earth began.

D. After the Crystalline Stalagmite just mentioned had sealed up the Breccia, it was, in extensive parts of the Cavern, broken up by some natural agency; much of both Stalagmite and Breccia were dislodged; and large quantities of, at least, the Breccia were taken out of the Cavern before the first instalment of Cave-earth was deposited.

In fine, that the deposits, chemical and mechanical, with the constructive and destructive processes just mentioned, were not only distinct and successive, but also very protracted, terms in the Cavern chronology is strikingly seen in considering the local changes they indicate; and the mind is thus prepared to learn that great and general geographical changes had occurred during the time which had been absorbed.

3rd. If, however, the foregoing *assumptions* (p. 485) be untenable—and I am not prepared to say they are not; if, in fine, the Hyæna were a member of the Devonshire fauna during the era of the Kent's Cavern Breccia and the "Fourth Bed" of Windmill-Hill Cavern, Brixham, I cannot but confess my utter inability to account for the entire absence of any trace of his presence or existence in the deposits just mentioned; and can only use words almost identical with those I used when treating of this question in 1877:—In the Cave-earth—the less ancient Palæolithic deposit of Kent's Cavern—the remains of the Hyæna greatly exceeded in number those of any other Mammal, and it may be added that he was also disclosed by almost every relic of his contemporaries—their jaws had, through his agency, lost their condyles and lower borders, their bones were fractured after a fashion known by experiment to be his, and the splinters into which they were broken were deeply scored with his teeth-marks. His presence was also attested by the abundance of his droppings in every part of the Cavern. Kent's Hole was one of his homes; he dragged thither, piecemeal, such animals as he found dead near it; and the habits of his representatives in our day have led us to expect all this of him. When,

however, we turn to the Breccia—the more ancient Palæolithic deposit of the Cavern—a very different spectacle awaits us. We meet with no trace whatever of his presence; not a single relic of his skeleton; not a bone on which he has operated; not a coprolite to mark as much as a visit.

I am fully prepared to admit that Hyænas of old were perhaps not likely to make a home of *every* cavern. Indeed, I have elsewhere recorded the fact that, while the most careful attention was given to the subject, not even a fragment of a coprolite was found in Brixham Windmill-Hill Cavern; and have expressed the belief that while that Cavern may, perhaps, have been occasionally visited by the Hyæna, he did not make it a home (*Trans. Devon. Assoc.* vi. 847). Nevertheless, his bones were found there in the "Third Bed"—the equivalent of the Cave-earth of Kent's Hole—though less abundantly than those of Bear, Reindeer, and Rhinoceros; while in the "Fourth Bed" at Brixham, as in its equivalent, the Breccia, of Kent's Cavern, he was utterly unrepresented in any way (*Ibid.* 814); and on the assumption that he was certainly a member of the Devonshire fauna in both eras, I feel utterly unable to account for the facts that while he dwelt in one of the Caverns and visited the other during a certain definite era, he neither dwelt in nor visited either of them during an equally definite but earlier era, nor was there then a single hyænine relic washed into either of the Caverns.

EARLY NONCONFORMITY IN NEWTON AND ITS NEIGHBOURHOOD.

BY EDWARD WINDEATT.

(Read at Newton Abbot, July, 1884.)

No History of England would be complete which ignored the part played by the Puritan party, especially in the 17th century; for whatever opinions we may hold as to their motives, and as to the truth or otherwise of the principles they professed, the fact remains, that to ignore their successes and defeats, their struggles and persecutions, is to ignore an important part of the history of our country.

And if this is true of our country as a whole, it is equally true of individual towns and districts—no sketch of a town is complete which does not contain a reference to the Nonconformist bodies settled in it.

The paper read by Mr. Worth at the Kingsbridge meeting of this Association, on "*Puritanism in the West, and the Exeter Assembly*," showed that from early times Puritanism had a hold in Devon, and the part taken by many Devonshire towns during the war between Charles I. and the Parliament, proves how strongly our county was imbued with Puritan principles. It is therefore no surprise to find that the roll of ejected ministers contains the names of many settled in this immediate neighbourhood; and it is to some of those ejected from livings, or settled afterwards in this immediate neighbourhood, I wish to refer.

NEWTON.

With early Nonconformity in Newton is inseparably connected the name of William Yeo, who in 1662 was ejected from the living of Wolborough. Mr. Yeo was a native of Totnes, and a member of a family of good standing in that town; in Totnes Church there were formerly tablets to the memory of members of the Yeo family. The one to the

memory of George Yeo and his mother, bore the following inscription :

“ Here lieth the tree growing approved,
Likewise her fruit of most beloved ;
Here lieth the stock and branch together,
Free from all sturdy storms and weather :
Here lieth the aged and the youth
The race of all approved truth.”

And on William Yeo's tablet :

“ My life was full of misery, of anguish, grief, and pain,
I hope at length to live with Christ, for ever to remain.”

In 1558 a Leonard Yeo was mayor of Totnes, and again in 1570.

Westcote mentions the Yeos of Hatherleigh, and refers to one Leonard Yeo, whose second wife was Dionysia, daughter of William Doteyn, of Harberton. A Dottyn, or Dotteyn, was mayor of Totnes in 1601, and again in 1617.

Some years later a member of the same family was among the benefactors to the charities of Totnes. One Agnes Yeo, by her will dated January 21st, 1645, gave to the mayor and burgesses of Totnes £20, to be employed in loan upon good security, towards binding poor children apprentice to some good trade.

William Yeo, afterwards settled at Newton, was educated at Exeter School, and contemporary both there and at Oxford with Dr. Manton.

Having studied for some time at Exeter College, Oxford, he removed to Emanuel College, Cambridge. After leaving the University he was chaplain in Colonel Gould's regiment, but not caring for the tumult of war, he settled for a time at Brighthelmstone, in Sussex. From thence he removed, by order of the committee of the Parliament, to Newton, where he appears to have gained the respect of all. It is said “ he found the town very ignorant and profane,” but that through his labours “ the people became very intelligent, serious, and pious.”

He appears to have been a terror to evil-doers ; for on Sundays, to prevent the profanation of the sabbath, he would walk round the town accompanied by the constable after public worship. While holding this living he lost an augmentation of £80 a year for refusing the Engagement. In 1656 his name appears as one of the members of the Exeter Assembly.

After Mr. Yeo was silenced, in 1662, he continued firm to his principles, and preached as the times would allow.

An order of sessions having been made, Michaelmas 1683, offering a reward of 40s. to any who should apprehend a dissenting minister, a constable compelled Mr. Yeo to hide, during a time of snow, in the fields, to prevent apprehension; and he was often obliged to leave his family, but was never imprisoned.

Under Charles II.'s indulgence, in 1672, Mr. Yeo took out a licence for his own house, Newton Abbot, as a Presbyterian, and also a licence for himself for Newton Bushell.

During the troublous times he met those who sympathised with him by night in Bradley Woods, and there conducted services.

At the Midsummer Sessions for Devon, 1689, it was certified to the court that the house of William Yeo, called Rydon, situate in the parish of Wolborough, was used for a place of religious worship under an Act of the then Parliament, intituled an Act for exempting their Majesties Protestant subjects dissenting from the Church of England from the penalty of certain laws. Subsequently a chapel was built in Wolborough Street, where he ministered.

He died at Newton, in October, 1699, aged 82 years, having in public and private ministered to the people for fifty-three years, respected by all classes of the community.

In the lobby of the present Congregational Church in Newton is a handsome tablet to his memory bearing the following inscription:

TO

The Honoured Memory

OF THE

REV. WILLIAM YEO, M.A.,

SOMETIME RECTOR OF THIS PARISH.

On the passing of the Act of Uniformity, in the year 1662,
 he, with a noble fidelity to conscience,
 resigned his living,
 and to avoid persecution, so rife in those troublous times,
 met his sympathizing parishioners by night in Bradley Woods
 for the worship of God,
 until a Chapel was built in Wolborough Street,
 at which he became Minister,
 and thus the founder of Nonconformity in this Town.
 Born at Totnes, 1617; died 1699.

This Tablet is erected by his descendants of the
 fifth generation, 1875.*

* The tablet was erected by Messrs. Evans, of Bristol.

It is worthy of note that Mr. Yeo, whilst holding the living of Wolborough, enjoyed the patronage of Lady Lucy Reynell of Ford, the grandmother of Margaret Lady Courtenay, who brought Ford and the Newton property generally into the family of the Earl of Devon, who still holds it. Lady Lucy Reynell, 10th March, 1640, being then a widow, by deed settled a piece of land called Churchill, in the parish of Wolborough, upon part of which she had erected four cottages in 1638, which she called "The Widows' Houses," upon trust for the use of widows who "*should be relicts of preaching ministers left poor without a house of their own, women of good report and civil conversation,*" and settled other lands at Newton and Paignton as an endowment for the widows. This charity still exists, but is confined to widows of clergymen of the Church of England.

The reference in the original trust deed to relicts of preaching ministers would appear to refer to the lecturers set up in many parishes by the Puritan party; and as parochial duties did not attach to the office, the lecturers were relieved of certain ceremonies, and consequently such ministers as felt Puritan scruples preferred to minister in this more limited way. There was a good deal of opposition to the appointment of these lecturers or preachers, though their stipends depended upon the voluntary gifts of the people; but in many corporate towns they were appointed. Rev. Francis Whiddon, M.A., was lecturer to the town of Totnes; and Dr. Barnabas Potter, afterwards Bishop of Carlisle, held a similar office very early in the seventeenth century.

At the very time Lady Reynell made the deed of trust before referred to, the appointment of these preachers was exercising no little commotion; and on September 8th, 1641, the House of Commons ordered, upon Mr. Cromwell's motion, that sermons should be preached in the afternoon in all parishes of England, at the charge of the inhabitants of the parish, where there were no sermons in the afternoon.

Lady Reynell confirmed the trust deed by her will, dated 1st November, 1650. She died 1652, and her monument (with effigy) is in the parish church. "The original widows' houses had," say Lysons, "the following inscription, now gone:

"THE WIDOWE'S HOUSE, 1638.
Is't strange a prophet's widowe poore should be,
Yf strange, then is the Scripture strange to thee."

Another ejected minister was, after the ejection, settled at Newton; viz., John Hill, M.A., of Lincoln College, Oxford;

born in Bristol, 1611. He was ordained by the Bishop of Hereford, 1635; he appears to have lost his living, Newton Ferrers, in this county, and suffered much persecution; he first went to Exeter, and afterwards settled in Newton, and, dying there, was buried in the chancel of Wolborough Church.

WOODLAND.

At Woodland, near Ashburton, was settled, during the Commonwealth, Thomas Palk, a member of a good old Devonshire family, of which Lord Haldon is now the head. He was born at Staverton, Devon, in 1636, and was educated at New Inn Hall, Oxford; was a thorough student, and having but a small library, he borrowed books of his neighbours, and abridged them for his own use.

In January, 1651, he married Miss Joan Fabyan, of Ashburton, at the parish church there. She was a member of a leading Puritan family in that town; and it is worthy of note that a member of the same family, Rev. Peter Fabyan, was, about a hundred years later, a Nonconformist minister in Newton.

Palk was ejected, in 1662, from his living at Woodland; and his farewell sermons, from John iv. 23, 24, were subsequently printed and published, under the title, *The Loyal Nonconformist; or, The Religious subject yielding to God His due, and to Cæsar his rights*. They were published anonymously, Palk subscribing himself in the epistle, "Theophilus Philanax Philadelphus."

In 1672 he took out a licence for Ogwell, to which place he had probably removed on his ejection; but he ultimately settled in Ashburton, no doubt in consequence of his connection by marriage with the leading family of Fabyan, and he established a meeting of his own there.

Mr. John Fabyan, of Ashburton, tanner, by his will, dated 24th July, 1690, gave 20s. "to the poor of Mr. Palk, his meeting, to be distributed by the hands of Richard Tapper and Thomas Eles, of Ashburton," two of the principal members of his congregation. He also left Mr. Palk 20s. Mr. Fabyan was buried at Ashburton, July 26th, 1690.

Mr. Palk suffered much for his Nonconformity; was harassed by the spiritual court for opening a school, and compelled to give it up.

He appears to have joined in the theological disputes in which so many of the ejected ministers engaged. One work which he published was *Usury Stated*; a reply to a work on

that subject by Mr. Christopher Jellinger, the minister ejected from South Brent, Devon. And Mr. Palk left, fit for the press, a vindication of his former work from Mr. Jellinger's reply; also an answer to Mr. Long's *History of the Donatists*.

The Palk family continued for some time in Ashburton, and were Nonconformists. Sir Robert, the first baronet, was baptized in the old meeting-house there. The family were engaged in carrying woollen goods to Exeter, Teignmouth, and Brixham, and resided at Headborough, on which place Sir Robert took out his baronetcy, and afterwards at Yolland Hill, which he purchased. In later years there was again a marriage with the Fabyan family, Miss Frances Palk marrying Mr. William Fabyan, and they were the great-grandfather and great-grandmother of the writer of this paper.

DENBURY.

Both parties appear to have suffered here during the changeable times in which their lot was cast, for Dr. Walker, in his *Sufferings of the Clergy*, says, that Richard Serle, A.M., was admitted to this rectory in 1642, and turned out of it not long after. In 1646, he adds, one Mr. Bickle, came to the living, who lost it again, in 1662, through Nonconformity.

Little is known of Richard Bickle, who obtained this living in 1646. It may have been that the successes of Fairfax in the West at that time caused the change by which he got the appointment to this rectory. He was ejected in 1662, and is said to have subsequently conformed; but this was not so, as he died a Nonconformist at Totnes.

After leaving Denbury, he seems to have remained in the neighbourhood; for in 1672 he took out a licence to preach at the house of Samuel Cabell, of Buckfastleigh. It is a very curious fact, that while the head of the house of Cabell, of Brooke, Buckfastleigh, was a great persecutor of the Nonconformists, a member of that family should have so far favoured them that his own house was licenced for Nonconformist worship, to be conducted by an ejected minister.

The persecutor was Richard Cabell, who married Elizabeth, daughter of Sir Edmond Fowell, of Fowelscombe. The Samuel Cabell who favoured the Puritan Party would seem to have been his uncle, the youngest brother of a Richard Cabell, who died in 1655.

Mr. Bickle subsequently settled at Totnes, and received £20 per annum during his life from Mr. Godson, his successor in the living of Denbury.

In 1672 a licence was taken out for worship at the house of Richard Stephen, Denbury; and Mr. Bickle may, as circumstances would allow, have occasionally ministered there to his old flock.

ILSINGTON.

William Stuke, M.A., of Oxford University, was born at Trusham, near Chudleigh, and settled in this living about 1653. Dr. Walker mentions a clergyman of the name of Hill, who held this living, and states he was "assured by an ancient gentleman that he was sequestered from this living, and immediately succeeded by Mr. Stoak." But either he had only such a title as the confusions would allow him, or else his admission was not entered. The last regular incumbent, before the year 1646, who appears on the Bishop's Register, was Robert Dove, A.M. "In 1663 William Bellinson, A.M., was admitted to the living per Priv ult Incumb, which last incumbent I take" (says Dr. Walker) "to have been Mr. Stoak before mentioned."

After Mr. Stuke was ejected he settled at Whitcombe, in the parish of Trusham, and having a good estate, when the times would allow he erected a meeting-house upon his own land, and preached there for some years to a large number of persons. This place was licenced, under the Indulgence of 1672, as "the Meeting House of William Stook at Whitecome House, Trusham;" and of the Presbyterian denomination. A licence was also taken out for the "meeting-house of John Stook, Trusham Parish." This may have been, and probably was, the dwelling-house of a near relative.

Mr. William Stuke died in 1677, after only three days' illness; and to show the respect in which he was held by his brethren of the Established Church, it should be mentioned that Mr. Satterleigh, the rector of Trusham, preached his funeral sermon, and in doing so said, "Now it is expected I should say something of the deceased. He was well known to all of you. He was a man that could preach well, but pray better, and he lost a good living to preserve a good conscience." He was a good scholar, and very highly respected. Large offers were made to him if he would have conformed, but he could not agree to the required terms, and always expressed himself as satisfied with his Nonconformity.

EAST AND WEST OGWELL.

From the living of East Oghwell was ejected a Mr. John Stephens, who is spoken of as "a most eminent preacher, and

a very pious man." He was accustomed to publicly catechise the young people of his parish in the church.

His name appears in the first division of the list of members of the Exeter Assembly, 1656, as "John Steephens, minister of East Ogwell." He does not appear to have taken out a licence under the Indulgence of 1672; but a Richard Stephens, possibly a relative, did for the adjoining parish of Denbury, and it may have been there that he gathered around him his adherents, as he lived to a great age, and continued preaching, though he was blind in the latter part of his life.

As has been noticed, under Woodland, Mr. Palk took out a licence for Ogwell, in 1672. Another person who took out a licence for this parish was John Syms, ejected from the living of Dean Prior, the licence being for his own house at Ogwell. This was at Metley, in West Ogwell. After he left Dean Prior he lived at Water, in the parish of Ashburton, and he, in 1672, also took out a licence for Ashburton.

Mr. Syms succeeded, at Dean Prior, Robert Herrick, the poet, who had been presented to the living by the patronage of the Earl of Exeter, on the promotion of Dr. Barnabas Potter to the See of Carlisle.

Dr. Potter had been preacher to the town of Totnes, and through Sir Edward Giles, of Bowden, Totnes, and Dean Prior, obtained the living of Dean; he was also intimately connected with the Seymours, of Berry Castle, and preached the funeral sermon for Sir Edward Seymour in 1613, which he afterwards published, dedicating it to Sir Edward Giles, and Lady Mary, his wife, whose daughter he, according to Lysons, had married.

Herrick, after his ejection, returned to London, and having no fifths paid him, subsisted on charity until the Restoration, when he returned to his vicarage, and Mr. Syms had to leave it.

Among the petitions for securing tithes and other profits of livings in the hands of churchwardens and overseers preserved among the House of Lords Papers is the petition of "Herrick, Robert, Dean Prior."

Herrick does not appear to have thought much of his parishioners at Dean, for when he had to leave his living he wrote his "Farewell to Dean Burn," the pretty stream which flows through the parish, in which he refers to them in any but complimentary language.

"Dean Burn, farewell; I never look to see
Deane, nor thy warty incivility;
Thy rocky bottom that doth tear thy streams,
And make them frantic, even to all extremes.

To my content, I never should behold,
 Were thy streames silver, or thy rocks all gold.
 Rockie thou art ; and rockie we discover
 Thy men ; and rockie are thy ways all over.
 O men ! O manners ! now and ever knowne
 To be a rockie generation !
 O people currish—churlish as the seas,
 And rude almost—as rudest salvages,
 With whom I did, and may re-sojourn, when
 Rocks turn to rivers—rivers turn to men."

After an absence of about twelve years, he returned to Dean, notwithstanding what he had written, and died there, October, 1674.

Herrick was expelled from the living in 1648, for refusing to take the Covenant, and it was then that Mr. Symms succeeded him.

On his ejection, Mr. Symms was much persecuted, and especially by Hugh Stawel, of Heerabear, in the parish of Bickington, one of a family of importance, members of which represented Ashburton in Parliament during the latter part of the seventeenth, and early part of the eighteenth, centuries ; they owned a moiety of the manor of Ashburton, now Lord Clinton's.

He had to hide from his enemies, and once hid in a hay-loft, and escaped, though those searching for him thrust their swords into the hay which covered him.

Mr. Stawel, on one occasion, with others, broke into his (Mr. Symms's) house while he was preaching, and disturbed the meeting ; and soon after that, one day meeting Mr. Symms, he told him he was going to London, but would attend to his business when he returned—referring to a possible prosecution for preaching. Mr. Symms replied, "Sir, you should ask God's leave." And the historian adds that Mr. Stawel went to London, but never returned.

On his death-bed Mr. Symms is said to have foretold the exact time of his death.

After having lain for some time silent, on the time he had foretold arriving, he exclaimed, "Tell my friends I have overcome, I have overcome," and died.

His funeral sermon was preached by Mr. Francis Whiddon, the Totnes ejected minister, and founder of Nonconformity in that town.

ON A NEWLY-DISCOVERED DYKE OF MICA-TRAP AT ROSEASH, NEAR SOUTHMOLTON.

BY THE REV. W. DOWNES, B.A., F.G.S.

(Read at Newton, July, 1884.)

Some excavations were lately made in the soil and rock adjoining Roseash Rectory, and rock was met with greatly differing from the ordinary rock of the neighbourhood. It differed so much, that even a non-geological observer could not fail to be struck by the fact. A specimen of it was shown, in the first instance, by the Rev. H. G. Southcomb, the rector, to Mr. D'Urban, of Exeter, who, in his turn, was good enough to call my attention to the subject.

Accordingly, in October last, I visited the spot, and through the kindness of Mr. Southcomb, and with the assistance of the workmen in his employ, I was able to form a clear opinion with regard to the area and mode of occurrence of this hitherto unmapped igneous rock. I say "*opinion*;" for, unfortunately, the trap-rock itself was not to be seen in section, and the excavation had been filled up, and built or paved over for the most part. The only section near at hand, a well to the eastward of the house, and about twenty yards distant from the outcrop of the trap, showed shale approximately vertical in dip, with the normal nearly east and west strike of the district. This in turn was capped by about three feet of soil, containing angular chips of shale, and a few angular pieces of trap, similar to that which occurs in the adjoining dyke.

That there should have been trappean fragments in the soil at this point is a little remarkable; for though the spot is only about twenty yards distant from the outcrop of the trap, it is higher up the hill, the slope being considerable.

It is generally reasonable to assume that soil upon a slope has been derived from the disintegration and decomposition of rocks *higher up* the slope, and not from that of those lower down. Moreover, the terminal curvature of the shale is an index which can hardly be gainsaid. The presence, therefore, of trappean fragments in the soil to the eastward of the house, or, in other words, at a spot uphill from the house, seems rather to indicate the existence of some other outcrop of similar trap in that direction. Of this, however, I could discover no direct evidence, and, in the absence of any section, it might easily escape observation.

To return, however, to the known outcrop. This is but a small lenticular patch, with a major axis of about sixty feet. From the clear and circumstantial description given to me upon the spot by an intelligent stonemason, it appears that this rock differs from the sedimentary rock around, not only in lithological character, but also in the fact (naturally very observable to one who has quarried the rock) that its divisional planes are horizontal; while the surrounding shale, in consequence of its sharp foldings, is everywhere vertical, or nearly so. From the same informant I gathered that the slabs and masses of the igneous rock became, as might be expected, sensibly larger in working downwards; and that as far down as they had excavated, they lay enclosed, more or less, in a matrix of clay.

The general strike of the sedimentary rocks of the district (uniform and monotonous shillet) is, as I have already mentioned, about east and west. On one side of the house, however, I found what might have been an indication of contortion of the strike; but it was only superficial evidence, and among trees, and therefore was not much to be trusted.

These are all the facts which observation or deduction furnished to me *in situ*. I could see no clear indications of contact metamorphism, though there were some fragments lying about of very micaceous grit. The clay matrix may doubtless be accounted for by the decomposition of the trap near the surface, and along the fissures penetrated by rain. The stone removed was found to work well with the chisel; but it is possible that the rock at a distance from the surface, if it had been reached, might have proved harder, and might otherwise have presented different characters. All the rock exposed was found to be perfectly homogeneous, and full of brilliant brown mica.

For further description of the rock I will quote from Mr. Rudler, of Jermyn Street, to whom I sent some specimens,

which he was good enough to have examined microscopically. In a letter, dated April 15th, 1884, he says: "There is no question but that the Roseash rock is what is usually called a Minette, or mica-trap; that it contains well-defined, six-sided laminæ of a dark brown mica, which would generally pass as Biotite; but that the optical properties of the Roseash mica are not those of an ordinary Biotite. It is probable that the Roseash mica may be referred to the species now called Anomite, but in a petrographical description it will be sufficient to describe it as a dark-coloured mica."

It is noteworthy that this igneous rock occurs in the midst of a large area hitherto supposed to have been quite destitute of igneous intrusion. The nearest igneous rock hitherto mapped is at Washfield, nine miles distant to the south-east, a rock totally different in lithological character, and one doubtless contemporaneous with the lower Trias; whereas the Roseash trap is evidently intrusive in the Culm-measures. Another igneous patch is mapped near Hatherleigh, at a distance of eighteen miles to the south-west; but the latter rock is at present unknown to me. Northward and north-westward there is upon the map no igneous rock nearer than Lundy.

ON PALÆOLITHIC IMPLEMENTS AND A ROMAN COIN FOUND AT BROOM, IN THE VALLEY OF THE AXE.

BY EDWARD PARFITT.

(Read at Newton Abbot, July, 1884.)

IN a large and nearly isolated mound near Axe Farm, on the Wadbrook, and at the junction of a stream called Blackwater, at Broom, about three and a half miles from Axminster, and near the river Axe, palæolithic implements have been found. The mound is principally composed of chert pebbles, more or less rounded, and mostly of a dull sandy or granulose kind, and more or less deposited in layers or beds of variable thickness. These beds are interrupted by the interposition of patches of yellowish sand, containing a few grains of Glauconite scattered through it. Here and there are thin ferruginous lines, highly charged with iron oxide, and irregular bands of black-ram. The mound in its highest part from the base, on which the ballast rails were laid, was 45 feet; but this was not the bottom of the gravel deposit. When entire it covered a large area, but a great part of it has been, and still is being, removed by the South Western Railway Company, for ballast for the railway. About five feet from the base is a narrow band, about three or four inches thick, varying in some places to eight or ten inches, and composed chiefly of a honey-coloured chert, of apparently finer grain, and more or less translucent; this chert is more fractured and clean, and the sand does not adhere to the fragments, as in other parts of the section. In this band we (Mr. J. M. Martin and myself) found several fragments and portions of pebbles, which approached the forms regarded as worked or manufactured tools; and it was only in this band that we found any that at all reminded us of the rude palæolithic implements. In this band we found

some small rounded nodules of a white sandstone, such as is frequently seen in the passage-bed between the Greensand and the Chalk. We could not discover any of these in other parts of the mound. The remarkable cleanness of the chert in this particular band struck us very forcibly, and suggested the probability that this was owing to drainage, although no water was then coming through it. And it occurred to us that this hypothetical water was the, or a part of the, cause of the chert here being more fractured than the rest, combined with the pressure from the weight of the mound above.

The finding of the white sand nodules so low down the mound would lead one to suppose that a sort of *bouleversement*, or turning over of the mass, had taken place.

Presuming that we are right in considering these nodules a part of the passage-bed referred to, it is but natural that at the breaking up of this bed, whatever cause may have been at work to do it, the top would fall and become the bottom; and in this we should expect to find, if any there were, the chert or flint implements, or anything pertaining to the surface of the land at the time.

In 1872 Doctor John Evans, in his *Ancient Stone Implements*, p. 559, said: "In the Blackmore Museum" [at Salisbury] "are four implements of chert, of oval and tongue-shaped types, found during the erection of telegraph posts between Chard and Axminster. There is also another thin, oval implement, of ochreous flint, $7\frac{1}{2}$ inches long, and $3\frac{1}{2}$ broad, which was found near Colyton, Devon. The exact locality where those first mentioned were found is unknown, but it appears probable that the gravel, like that at Colyton, belongs to the valley of the Axe, in which it is very desirable that further search should be made. With the exception of those from the bone caves of Devonshire, no palæolithic implements have as yet been found further west in Britain."

This paragraph is, I think, important as registering the date of the finding of those interesting antiquities in Devon. Since then a great accession has been made to them from the special locality we have under consideration. Although I do not go so far as some in ascribing all those chips and apparently artificially worked flints, and other hard materials, to what seems to be for some kind of use, there are others, however, which belong to the rude stone age, and if worked by Nature's own hand, she must be accredited with exceeding ingenuity. Dr. Evans, in a paper in the *Journal of the Anthropological Institute*, May, 1878, says, of the imple-

ments found at Broom, "In form they closely resemble the ordinary types from the valley of the Somme, and other well-known palæolithic deposits, but the prevailing type is a somewhat flat ovoid."

In the Albert Memorial Museum at Exeter, are a number of implements displayed in two large cases, some of which are of a very rough description, and require a little exercise of the imagination to connect them with the history of man; at the same time there are others of which it is self-evident that they were artificially fashioned by man. The chert of which these implements are made, is not so tractable a material as the chalk flints, hence perhaps the rough and doubtful character of many of them. And if we consider the comparatively near proximity of the chalk containing good flints, it seems strange that the tool or implement makers should not have availed themselves of it, rather than use so imperfect a material, although close at hand. Mr. Brent, in a lecture delivered at the Plymouth Institution, of which I have only seen an abstract, in the *Journal* of that Institution for 1879-80, p. 298, says: "The implements from Broom, consist for the most part of chert; a few only have been found composed of flint."

There can be no doubt as to the source of the materials composing this immense mound, as the Greensand deposit still caps the hills on each side of the Blackwater, at Holditch on the one side, and Titherleigh in the parish of Hawkchurch on the other, and the Broom deposit is near the junction of the Blackwater with the Axe. These streams must, however, in early Quaternary times, have been of a much greater volume, and flowed at a much higher level, than they have within the modern period, as is clear from the enormous mass of materials collected together, and the height of the mound. I mentioned just now, that it is strange the implement makers did not avail themselves of the chalk flints so near at hand. Dr. J. Evans says in the paper referred to, that he "noticed a few chalk flints, some pebbles of hard chalk, and a few of quartz and clay slate. And it may be observed that the chalk occurs *in situ* at about three miles distance, resting on the Blackdown beds, between which and the Lower Lias the marls now crop out." This, it must be acknowledged, much superior material for the manufacture of implements being so near at hand, while so far as I am aware none made of flint have been found here, except those mentioned by Mr. Brent, has caused me sometimes to doubt the authenticity of some of those acknowledged by others to be of artificial construction.

The palæolithic man was generally wise enough to select the best materials in the locality in which he might be placed, but in this case he certainly did not, so far as has been seen, exercise that keen insight into his surroundings which might have been expected. Leaving the palæolithic man and his works, we come now to a much later period, namely, to Roman times.

In some of the ballast taken from this pit, as it is called, in the latter part of 1883, Mr. Medway, the Superintendent of the South Western Railway between Exeter and Salisbury, found a Roman coin. When found, it was much encrusted with the ballast sand. The coin apparently has been much worn, but is sufficiently perfect to determine to whose reign it belongs. That I might get the best advice upon it, I sent it to Dr. Evans, who very kindly described it as follows. Obverse, FL IVL CONSTANTIVS NOB. C. (Flavius Julius Constantius Nobilis Cæsar.) On the Reverse, GLORIA EXERCITVS. Two Standards, between two soldiers standing. In exergue TRPS. (Treviris paenna signata?) Struck at Treves. The coin is one of Constantine II. as Cæsar, A.D. 337. About four miles from Broom are two castles, as they are called, ancient earthworks, or fortified hills, named respectively Lambert Castle and Conig Castle. Two small streams arise near to these earthworks, at the head of the Blackwater before mentioned, and connected with it. Mr. Pulman, in his *Book of the Axe*, 4th edition, p. 536, says: "Lambert's Castle, vulgarly called Lammas Castle, is a lofty entrenched eminence in this parish [Hawkechurch] forming one of the interesting group of hills in which Pillesdon and Lewesdon are included, and was probably one of the many frontier defences of the ancient British Morini, or Durotriges, of Dorset." Mr. Warne considers Lambert's Castle to be of Roman origin, the last of the camps constructed by Vespasian in his invasion of Britain, and conquest of the Durotriges. Ample evidence of Roman handiwork is visible at Lambert's Castle, as is the case with so many other local entrenchments, the Romans having naturally taken possession of such of the pre-existing Celtic camps as best suited their purpose." The proximity of this Roman camp probably explains the finding of the coin in the accumulated *débris* from the adjoining hills. It may have been carried down by the stream and deposited, or it may have been dropped on the mound, and then made its way in the course of time into the heap. It is, however, interesting as apparently connecting the Romans with this particular locality.

SIR FRANCIS DRAKE: HIS ORIGIN, ARMS, AND DEALINGS WITH THE PLYMOUTH CORPORATION.

BY R. N. WORTH, F.G.S.

(Read at Newton, July, 1884.)

Two papers published in the *Transactions* of the Devonshire Association for 1883 deal more or less directly with matters of controversy touching the career of Sir Francis Drake, and criticise, more or less explicitly, certain statements which, in the interests of truth, I had felt bound to make. Until the appearance of those papers I had no intention of bringing this subject under the notice of our Association, but justice alike to historical accuracy and to myself now renders another course necessary. Nor is this perhaps wholly to be regretted. Drake fills so large a place among the Worthies of Devon, his real character and doings have been shrouded in such a cloud of misty legend, and there is so much absolute ignorance concerning some of the leading facts of his life—an ignorance moreover fostered by party and enhanced by prejudice—that a contribution to his biography which owes nothing to fancied possibilities or fruitful imaginations, but is based throughout upon direct contemporary evidence, should be wanting neither in interest nor in value.

The first of the papers to which I refer, "Some Recent Revisions of the Drake Chronology,"* originated entirely in an accidental error in copying a quotation, the probability of the existence of which error I had already myself indicated, and which in no way invalidated the arguments used. A date was wrongly given, but the circumstance connected with the date was rightly stated, and this was the only essential point.

* Rev. J. ERSKINE RISK, M.A., *Trans. Devon. Assoc.* xv. 196-201.

The paper, therefore, turned purely upon a question of hyper-criticism, as will be seen when I proceed to set forth the full history of the connection of Sir Francis Drake with the Plymouth Waterworks.

The second of these two papers is, however, of a very different class.* Under the title of "Drake—the Arms of his Surname and Family," it is sought to prove that Sir Francis was a man of high descent; that his name was derived at least from the ancient dragon standard of the Britons, itself of mystic Oriental origin; and that he was himself entitled to bear the red dragon, or wyvern, which he undoubtedly did quarter with the coat granted him after his voyage of circumnavigation—the fesse and pole stars.

When, however, we have read all that has been written in defence of the hypothesis of Drake's distinguished origin, we find that it rests solely upon supposition, and that such direct evidence as we have is quite the other way.

For centuries the name of Drake has been common in the middle and humblest walks of life in South Devon, nor did it ever rise into prominence in that part of the county until made famous by Sir Francis himself. In the East of Devon, on the contrary, the Drakes of Ashe were an ancient and distinguished family centuries before the Tavistock bearers of the name had emerged from their obscurity. Nevertheless it is perfectly true, as Dr. Drake has admitted, that "the name of Drake is associated with no summons to Parliament, nor important Domesday tenure,"† and therefore that there is no pretence to claim for the Drakes as a race the antiquity and distinction needed to trace their origin to British nobles, much less to Roman Draconarii, or to Indians, Assyrians, Persians, Scythians and Dacians, as adopters of the "Dragon standard." In simple truth, the surname of Drake is precisely of the same class as that of Duck, Sparrow, Finch, Raven, Crow, Jay, Hawk, or Gull; and there is just as much reason (and no more) for assuming that all the bearers of either of these names came from one stock as for holding this of the Drakes. Moreover, there is direct evidence that the association of the Drakes with the wyvern, or dragon—in old English "drake"—was the result, not of hereditary descent either from dragons or their bearers, but of the "canting" conceit of a punning and oftentimes ignorant generation of heralds—those who gave

* H. H. DRAKE, M.A., PH.D., *Trans. Devon. Assoc.* xv. 487–493.

† *Op. cit.* p. 487.

the "three hands" as a coat to Tremayne, and the "three fusils" to Trefusis, regarding these names as French instead of Cornish. This is shown by the indisputable fact that the oldest coat of the Drakes on record is *not* the wyvern, but three battle-axes. The "drake," therefore, is not the arms of the surname when it first emerges into historical sight.

But may it not be that of the Tavistock family? No member of that family before the time of Drake is recorded to have borne arms; and the most diligent researches have failed to show that any of them was higher in rank than an ordinary ecclesiastic—in those days no proof of family at all. Sir Francis's own father was a minister. There was a William Drake, probably related, vicar of Whitchurch and rector of Sydenham, who died in 1548; and about the same time there was in Tavistock, as a copy of a deed in the handwriting of Serjeant Hele, among the muniments of the Plymouth Corporation, shows, a certain William Drake, blacksmith, who acquired a house once belonging to Edmund Jordan. And that there was an earlier connection of the Drakes with Plymouth than the time of Sir Francis, the entry of one Thomas Drake as freeman, in the reign of Henry VIII., shows.

Neither direct nor collateral evidence of the original status of Sir Francis and his family is, however, wanting. The fact that his first wife was of yeoman station is some indication of his own position at the time he married her. He looked higher when he was a widower and had risen in the world. Moreover, the Hawkinse, his kinsfolk and early patrons, were without arms until Sir John won them by his valorous deeds. The most important direct testimony is that supplied by the Plymouth Corporation records, in lists of freemen and the like. We find on examining these documents that the strictest care was taken all through the sixteenth century to distinguish the social positions of the persons named; and here, both as regards the Hawkinse and the Drakes (Francis and Thomas), we can trace the steps by which they ascended through the stages of "generousus," "armiger," and "miles." When first mentioned it is with neither prefix nor affix, and the supplement of the plain Christian and surname with these marks of distinction corresponds exactly with the dates when we know they were acquired. Francis Drake, who was admitted to the freedom of the borough of Plymouth in 1570, then neither claimed to bear arms, nor was recognized as of gentle, not to say knightly, blood.

Nevertheless it is a fact that in later years, when plain

"Francis Drake, mariner," had grown into "Sir Francis Drake, Knight," and had matched with the blue blood of Devon, he quartered the wyvern; then long borne by the Drakes of Ashe in replacement of the older battle-axes, with the fesse wavy and pole stars granted him by Robert Cooke, Clarencieux. The sole point in question here is the right by which this was done. It is clear that he had no heraldic authority. When his admitted grant of arms was made, he indeed asserted that Sir Bernard Drake and others of that family were ready to attest that "the sayd S^r Fraunces Drake may be prerogative of his birth and by right descent from his auncestor bear the arms of his surname and family, to wit, Argent, a Waver Dragon geules;" and these words appear in the original draft of his patent. Had they appeared also in the patent itself, there would have been an end of reasonable controversy. Unfortunately, however, for him, neither Sir Bernard Drake nor any member of his house was inclined to make such an admission. Sir Francis, therefore, failed to prove his claim, and when the patent was prepared these all-important words were omitted. Dr. Drake says they were left out because the ornamentation of the parchment took up too much room; in other words, that the text of this legal document was made subordinate to the flourishes! It cannot be necessary to argue seriously in refutation of such a suggestion, in which moreover, among all antiquaries and heralds of competent reputation, its author stands absolutely alone. Nor need we concern ourselves about the curious story told by Prince of the manner in which Sir Bernard resented Sir Francis's claims—by boxing his ears. I cheerfully admit that Prince is not infallible, but then he is not to be rejected or accepted without reason at pleasure. The fact that the claim was made in the draft and expunged in the patent is the very strongest evidence of its worthless character; and if further proof were required, we have it in the abandonment, after the death of Sir Francis, by Thomas Drake and his descendants, of the wyvern, which the great seaman had usurped in his masterful way. The simple explanation of the whole business is that Sir Francis Drake, like many a *parvenu* of modern times, was not content to be the founder of his own fortunes, but was weakly anxious to assert hereditary claims to a position in polite society.

But this, after all, is a matter of minor interest. The chief object of the present paper is to set forth from contemporary documents the story of the connection of Sir Francis with the Plymouth Corporation, and the true detail of the origin

of the Plymouth Waterworks. It is only since 1881 that this has been possible with any fulness or accuracy. In that year the Corporation recovered a volume of Receivers' Accounts which had lain among the archives of a private family for at least a century and a half, and which cannot be proved to have been in the hands of the Municipality since June 17th, 1679, when it was produced in evidence by them in a lawsuit. The entries in this book not only threw a flood of light upon the general history of Plymouth in the reign of Elizabeth, but explained many matters that had long been of doubtful purport, and, what was equally valuable, indicated directions in which further search could be made. It is now possible, therefore, to compile a connected and fairly complete accurate record of the history of the ancient water supply of Plymouth, as set down at the time by the men who provided it. That this contemporary evidence should ill accord with tradition was perhaps only what might have been expected; but I was not at all prepared for the character of the controversy that arose when the true detailed facts were first made public, nor for the preference avowed in some directions for rumour and hearsay over direct official testimony. And to my mind all that was in dispute was practically given up when it was tacitly admitted that the position which I had taken could only be assailed by denying, not my inferences, but the validity of the official records and legal and other contemporary documents on which they were based.

Those who are curious in the history of the development of what I have elsewhere called the "Drake myth" will find the materials in the eighth volume of the *Transactions* of the Plymouth Institution, where I have collected all the passages from the various annalists of Devon which profess to give an account of the connection of Drake and the Plymouth Leat. Each copying more or less from his predecessors, without the slightest resort to original authority—repeating old errors and adding new ones of his own—what may be called the historical tradition has progressed from the perfectly correct assertion that Drake "brought" the water into Plymouth to the utterly mistaken statement that he "gave" it. And side by side with this there has developed an oral tradition (which, however, as yet no one has been found hardy enough to defend), that the water was brought into Plymouth by "art magic," following the tail of Drake's horse in virtue of certain cabalistic words pronounced over it at its source. The two legends have progressed upon precisely the same lines, and the only difference between them is that one has moved a little faster

than the other. Each has precisely the same claims to our respect.

We must observe, however, that there was a third, a corporate or official tradition (for such it really was while the evidence remained lost), and that this was always in effect the same. The portrait of Drake, placed in the Plymouth Guildhall in 1617, simply records that he

“With fresh streames refresht this towne that first
Though kissed with waters yet did pine for thirst.”

A tablet which formed part of the Old Town Conduit at Plymouth, placed therein when it was rebuilt in 1671, only states (the original conduit of 1598 had no reference to Drake, “*Sr Francis Drake first brought the water into Plymouth in 1591.*” The chief toasts at the Fishing Feast of the Plymouth Corporation, when the leat is inspected and the Head Weir visited, though they do not date back 200 years, are merely, “The pious memory of Sir Francis Drake;” and, “May the descendants of him who *brought* us water never want wine.” The authoritative declaration of the ancient Corporation of Plymouth (though even with them, in the absence of the record, we can trace a certain manifestation of vague sentiment, as seen in the Feast, which was fostered by members of the Drake family) never, in fact, went beyond the word “brought;” and when in 1822 they were called upon to make a formal return to Parliament on the matter, they declared, in reply to the question, “At whose expense and when were the works constructed?” “In the reign of Elizabeth, at the expense of the Corporation.”

At that date attempts had been made, which assumed more formidable proportions later on, to declare the water supply of Plymouth a charity founded by Drake, and not a property created by the Corporation. Although deprived of many important documents, for which both in Plymouth and London they then searched in vain, the authorities succeeded in establishing their right; and there all controversy should have ended. Unfortunately—from our present point of view—the destruction of the old municipality, the rapid growth of the town from without, and the removal or extinction of many of its old families, cast the chief burden of local government upon the shoulders of gentlemen who were ignorant of the history of the Corporate affairs, and have blundered thereon accordingly in a style that would have been impossible with the least-instructed member of the old “twelve and twenty-four.” The position I maintain then is precisely that which

was held by the old Corporation of Plymouth, continuously from the time of the formation of the Waterworks until its dissolution in 1835. I do this, however, with the aid of contemporary records, some of which had been removed from their custody, and all of which they sought for diligently, but sought in vain. And I trust I may add (without being thought to place myself too prominently forward), with the aid also of a local knowledge which would have spared certain zealous defenders of the exterior tradition some of the most curious blunders in topography and interpretation that ever amused the patient student of historical veracities, or illustrated the wild fancies of an unbridled imagination.

With this introduction I proceed, as Verstegan phrases it, to "the restitution of decayed intelligence" on this matter.

There is abundant evidence that the water supply of Plymouth was, in the first place, derived chiefly from wells. Among the names of wells of a more or less public character that have been preserved we find Buckwell, Quarrywell, Ladywell, Finewell, Westwell, St. Andrew's Well, Holywell, Harwell, and Martock's Well. The sites of several of these are still known, and they were evidently fairly scattered throughout the town, as it then existed. The old Conduit by Notte Street was supplied from a well in Well Park adjacent, continuously on through the seventeenth century. Private wells must also have been numerous. Indeed Plymouth is exceptionally supplied with underground water, and there are even yet a number of very productive wells along the line of junction of the slate and limestone rocks, in the less compact slates, and associated with the trappean bands; and these, two years since, when a severe frost deprived the town of its ordinary water supply, proved capable of materially relieving the necessities of the inhabitants, large as the population now is.

In addition to the wells, there were at least two streamlets within the precincts of the borough, which flowed through the town. One of them rose in what is still called Shute Park, though now covered with houses; and the site of the other is still marked by the name Hampton Shute. The first of these (which now passes away by the sewers) must have been of some little importance, since what is now Bilbury Street, which lies between its source and Sutton Pool, was anciently in part called Bilbury Bridge. More distant, but yet barely a mile from what in the sixteenth century was the centre of the borough, were the still existing streamlets at Pennycome-

quick and Lipson; and to these it was the custom to resort when the ordinary supplies within the limits of the town itself fell short in time of drought. Neither of the two latter were, however, available without carriage.

The governing body of Plymouth from an early period interested itself in this matter of water supply. In fact, we find in the earliest volume of accounts preserved, under date 1495-6, in the mayoralty of William Nycoll—

Itm p^d for mendyng of a Cunditt yⁿ the tenemente some
tyme Nicolas Elsworth y^a xiiij^d

So in 1509-10 work was done in John Paynter's close "for the conveyance of the wat^r yn to the waye." Some entries of this class may be doubtful; for the word conduit is not always applied in its more modern sense; but others are clear enough. References to wells cannot be mistaken, nor can such entries as the following, one of a numerous class. It occurs under the mayoralty of William Weeks (1549-50):

Itm paid for plats of Ire to amend the boxe of the
plumpe of the well of the south syde and for
Arnold Rawlyns labour abowte the same iiij^s iiij^d

It is not unimportant to note here that this pump was undoubtedly used for the supply of vessels; whilst the continual entries of outlay thereon in repairs show that it saw a good deal of service.

But the town was growing and its needs increasing. Not only was a better supply of water wanted for the residents, but the "plumpe at the south syde," so constantly out of order, was utterly unable to meet the demands of the shipping. "Old Will Hawkins," father of Sir John, had opened the Southern Seas to English trade. His sons were following in his track when Elizabeth came to the throne; and with many another merchant adventurer of the ancient fighting type, and many a captain of the Royal Navy, made Plymouth harbour a place of constant resort. The port outgrew its primitive system of water supply; and so in the mayoralty of Lucas Cock, under date 1559-60, we find the following entry among the records of Corporate expenditure:

Itm to M^r forsland of bovy & his company for vewinge
of the ground wherebie freshe water myght have
byn brought unto the towne xvj^s x^d

Here then is the real starting-point of the Plymouth Corporation Waterworks. Mr. Forsland, as we learn from the Stannary Records, was a man of some note in his day. By occupation a "tin streamer," he was a member of the Stannary Parliament that assembled at Crockern Tor in 1576, and was of sufficient standing to be described as "gentleman." Of all men in those days, a "tin streamer" was best qualified to advise on a question of water supply. Water was indispensable for the washing of the tin ore out of the alluvium in which it was worked; and to obtain this water the streamers sometimes carried their little "miners' leats" for miles, winding round the flanks of the hills. There are artificial courses of this character still in existence, of a great and unknown antiquity.

Though it is not said whither Forsland went, it is quite clear that it must have been some distance from the town; and to anyone who is acquainted with the topography of the district, it will be apparent also that the nearest point from which a sufficient gravitation supply could have been obtained must have been on the river Meavy. However, as nothing appears to have come of this work beyond the payment, the entry is chiefly valuable as showing that the idea of bringing water from a distance originated with the Corporation. That it could not have originated with Sir Francis Drake will be apparent when we remember that at this date he was a young sailor, probably in his twenty-first year. His kinsmen and early patrons, the Hawkinse, were then members of the Plymouth Commonalty, if not of the select "twelve and twenty-four" in whom the government of the town vested. William Hawkins became freeman in 1553-54, John Hawkins in 1555-56. Drake was not made free until 1570-71. He cannot be connected with an act of the Corporation which took place ten years before his admission to the freedom; and indeed in 1568, after his return from San Juan d'Ulloa, he was so far from being a man of mark, that when William Hawkins sent him to London with tidings of the disaster, he called him his "servant, Francis Drake."

Whatever the reason the Corporation were unable to follow up the survey of Forsland, they were not unmindful of the wants of the town. Entries now occur of expenditure, not merely upon the Southside pump, but upon a pump in Hawe Lane, and on a town well and pump. Moreover, in 1569-70 William Hawkins built a new conduit; and either this or another conduit associated with the Market Cross came to repair in 1571-2. And that this conduit was supplied by a

stream of some sort (probably from Shute Park) is shown by an entry in the mayoralty of John Sparke (1583-4):

Itm pd to Wilstrewe for bringinge the water above
grounde to the Conditt v^a

Meanwhile the Corporation had not abandoned their wider scheme. They had it before them, at any rate, in the mayoralty of John Ilcombe (1576-7); for then we have the entry:

Itm pd to certayne men that vewed the River at the
requeste of m^r mayo^r & his brethren for their
paynes & for their charges aboute the same lijs^a v^d

Here it is clear, from the mention of the river, that the Meavy is the source intended. It is clear also that "Mr mayor & his brethren" are the moving spirits. Of these brethren Drake was not then one. Indeed, as he sailed on his voyage of circumnavigation in November, 1577, he must have had his hands quite full of other matters, more important to himself personally. The entry, in its date and language, is, however, conclusive without the need of collateral evidence. The scheme was in existence when Drake sailed. It could not, therefore, have originated, as has been asserted, in the acquaintance made by him during that voyage with Peruvian aqueducts; still less could it have originated in his mayoralty, after his return, in 1581-2. The Corporation scheme of 1559-60 is the Corporation scheme of 1576-77, and that again was the scheme carried to completion in 1590-91. It is not difficult to understand why there was this delay. During the earlier years of the period, as the accounts show, the Corporation was struggling with financial difficulties, and could hardly meet current expenses; and later on the operations against Spain absorbed all its energies and resources.

For example, there are the numerous entries concerning the Corporate outlay on St. Nicholas Island, commencing as early as 1547-8, when Drake was under ten years of age; and we read:

Itm geven in Rewarde to the pst w^{ch} brought the
Counsaylls lres for the fort to be made on saynt
Nichos Irlond xij^d

While in the same year work was done on the island under the direction of Sir Francis Fleming; and William Hawkins, John Elyott, John Ilcombe, and Richard Hooper rode to London about the business, and had £2 each.

It was not, however, until some thirty years later, just the period when the need of improved water supply had become most pressing, that the chief expenditure was incurred in this direction. For example, we have in 1579-80 :

Itm pd to w^m hawkins esquire for money laide owte in
pcurying the patent for the Ilonde and for his
change in the suyte thereof xxij^{li}

And in 1583-4 :

Itm pd owt this yere in sondrie work, as in fortefyenge,
buyldinge, entrenchinge and other munytions
boughte for the fortificacon of St. Nicholas
Island ij^lxxix^{li} xiiij^s iiij^d ob

While work of this kind was in hand the Corporation had neither time nor money to take up any less pressing matters, however important they might be.*

Probably, however, this was not the only reason. The inquiries made would have shown that the Corporation did not possess the power to carry out the work without the intervention of the Legislature; and as no Parliament was called by Elizabeth from 1572 until the close of 1584, there was no opportunity in the interim to obtain the needed authority. Directly Parliament was convened, however, the Corporation set to work and drew up a bill, the history of which is to be read in the *Journals* of Sir Simonds d'Ewes.

The burgesses chosen for Plymouth were Christopher Harris of Radford, and Henry Bromley; and the town accounts show that intimation of their election was sent to Drake and to John Hele (the celebrated Serjeant, then "town counsel," and afterwards Recorder, and undoubtedly the framer of the Bill), who were both in London.

Itm paie to a man to goe to London wth L^{res} to S^r
Frauncis Drake & Mr. Hele touchinge o^r Burgesses
for the Parliamente xxiiiij^s

* I have elsewhere suggested it as a curious problem for solution why and when the island dropped its name of St. Nicholas for that of Drake, who had nothing at any time to do with it, and, as the entries quoted above show, certainly never raised the battery there, as stated in *Westward Ho!* So far all the efforts made to prove a connection between Drake and the island have only resulted in a reference to the fact that the Corporation once made a request (which was *not* granted) that Drake might be appointed its captain. I have been myself unable to trace the use of the name further back than the early part of the present century; so that it is evidently a trivial term of very modern origin, and has no official or recognized status. Until indeed within the past half century the name on the maps was invariably given "St. Nicholas."

Now the entries in D'Ewes' *Journals* touching the Plymouth Water Act are as follows :

On Thursday, the 10th of December [1584], Two Bill [*sic*] of no great moment had each of them their first reading, of which the first was the Bill for the preservation of Plymouth-Haven.*

[Monday, 21st December]. The Bill for the preservation of the Haven of Plymouth was upon the second reading committed unto Sir Francis Drake, Mr. Wroth, Mr. Edgecombe, and others, who were appointed to meet the third day of the next sitting of this Court in Lincolns-Inn Hall in the afternoon of the same day.†

[Thursday, 18th February]. Five bills of no great moment had each of them one reading; of which the second being the Bill of Plymouth-Haven was upon the second reading committed again to the former Committees, and Mr. Grafton was added unto them, and the Bill was delivered to Mr. Wroth, who with the rest was appointed to meet in the Middle-Temple Hall to-morrow in the afternoon.‡

[Saturday, 20th February]. The Bill for Plymouth-Haven was brought in again with a Proviso.§

[Tuesday, 23rd February]. A Proviso was added to the Bill for Plymouth-Haven, and was twice read, and Ordered with the Bill to be ingrossed.||

[Saturday, 27th February]. The Bill for Preservation of Plymouth-Haven passed upon the Question after the third reading, and was presently sent up to the Lords by Mr. Treasurer [Sir Francis Knolles] and others.¶

[The Royal Assent was given Monday, 29th March].

As the Parliament met on the 23rd November, 1584, and the Bill was introduced on the 10th December, it is evident that no time was lost by the Corporation. The delay between the 21st December and the 18th February is mainly accounted for by the Parliament having been adjourned from the former date until February 4th.

And it is here, in the *Journals* of Sir Simonds d'Ewes, we have the first mention of Drake in association with the Plymouth Water Supply. He was then member for Bossiney; and it will be seen that his connection with the bill was simply that of member of a select committee, of which Mr. Wroth, member for Middlesex, was chairman, and to which Mr. Edgecombe, member for Liskeard, and Mr. Grafton, member for Grampound, also belonged. When these facts

* D'Ewes' *Journals*, p. 337, col. ii.

† *Ibid.* pp. 352, col. ii.; 353, col. i.

|| *Ibid.* p. 355, col. i.

† *Ibid.* p. 345, col. i.

§ *Ibid.* p. 353, col. ii.

¶ *Ibid.* p. 361, col. i.

first came to my notice, I was inclined to regard them in a somewhat different light to that which now seems at least possible, and as proof positive of the independent action of Sir Francis, remarking :

Had he been using private influence to push the Bill through, he could not, as a man of honour, have assumed what would have been a more than questionable position. Further, we cannot believe that the other members of such a committee were mere tools in his hands. We are thus driven to the conclusion that the bill was dealt with on its merits, and that Plymouth is as much indebted to Drake's colleagues in committee, for their performance of a public duty, as to himself.

I do not now think it quite so easy, with the still later facts that have come before me, to save his reputation at the expense of his influence.

The Bill is a curious document, and is worth giving *in extenso*, as preserved among the records of the Plymouth Corporation.

It is entitled "An Acte for presvacon of the Haven of Plymowth."

Whereas yo^r Ma^{ty} Towne of Plymowth in the Cowntie of Devon being an auneynt Borough Towne bordering upon the meane Sea, yet havinge a pleasaunte and safe Harboroughe and Rode for Shippes within or nere the same, comonlie called Plymmowth Haven, wheare as well yo^r Ma^{ty} Shippes as the Shippes and Vessells of dyvers yo^r Highnes Subiects tradinge into forren Partes and from Porte to Porte within this Realme do often upon necessitie and otherwise arrive harboroughe refreshe and vittell themselves as well wth fresshe water, being a thing very necessarie for them, as with divers other thinges, Hathe, for the moste Parte of the yere, none, or at the leaste verey litle, fresshe water within a myle of the said Towne or thereabowt, a matter verey incomodiouse ; By reason whereof yo^r Ma^{ty} Shippes and the Shippes of yo^r Highnes subiects arryving and harbouring in the saide Haven as aforesaide the Marryners of the same are manye and often Tymes dryven by necesytie to goe a Myle or more from the saide Towne and their Shippes to fetch fresshe water for their necessarie uses, by reason whereof dyvers Tymes they lose dyvers good Wyndes and oportuyties whiche they might take benefite of, yf they mighte water them selves nere their shippes ; besides the saide Towne being subiect to fyer, as well by the Enemye, for the same was once burned by the Frenche in the tyme of Warre, or by negligence and other mishappe at Home, there is no Water in or nerer the saide Towne for the moste Parte of the yere (especiallie in the Sommer Tyme when the Daungers bee greateste) then a Myle or sometyme

more, as the dryeth is, and wheare also the said Haven of Plymouth, being one of the pryncipall Havens and Harboroughes of the West Parts of Englande, doth Daylie querre & fill wth the Sande of the Tynnewoorcks and Mines nere adioyneng to the same, and in shorte Tyme wilbe utterlie decayed yf some Redresse and speedie Remedie be not hadd; and wheare also there is a Water or Ryver within the saide Countie of Devon called the water or Ryver of Mewe als Mevye distaunte from the saide Towne abowte Eight or Tenne myles, Parte of the whiche Water or Ryver wth some chardge wilbe brought into the saide Towne of Plymouth without any greate Preiudice or Damage to anye Owner or Owners of any Lande throughe whiche the same shalbe conveied, By reason (the moste Parte) in effect all the same Lande is either barren and heathie or ells hillye and drye grounds whiche wilbe bettered and amended by the water that shalbe brought throughe the sama. By brynging of whiche water moste of the Incomodities and Daungers and divers others shall not onlie be remedied, but also some Parte of the Chanell of the saide Haven scoured & cleansed by the same Ryver to the p^rpetuall contynewance of the same Haven, a matter moaste beneficiall to the Realme.

And wheare also the Inhabitaunts of the same Towne are Incorporated by Kinge Henry the Sixte by the name of the Maio^r and Coialtie of Plymouth whiche is confirmed by yo^r Ma^{tie} and dyvers yo^r noble Progenito^{rs} Kings of this Realme.

Maye it therefore please yo^r moste excellent Matie of yo^r moaste noble and abundant Grace and accustomed Favoure that yt maye be Inacted by this present Pliaiment that yt shalbe Lawfull to & for the saide Mayo^r and Coialtie and to theire successo^{rs} at all Tymes after the Feaste of Easter nowe next comynge, to digge and myne a Diche or Trench conteineng in Bredthe betwene sixe or seaven Foote over in all places throughe and over all the Lands and Grounds lyeing betwene the saide Towne of Plymouth and anye parte of the saide Ryver of Mewe als Mevye, and to digge, myne, breake, banck and cast vpp, all and all maner of Rockes Stones Gravell Sande and all other Lets in any places or Groundes for the convenyent or necessarie Conveyenge of the same River to the saide Towne, and further from Tyme to Tyme to doe Repacon and make Weares Bancks and all other Things necessarie whereby the saide River may be brought & conteynewe vnto the saide Towne withowte Lette Denyall Vexacon or Trouble of the Lord or Lords Owner or Owners of the same grounde or of any other pson or psons by suyte in the Lawe or otherwise upon Payne of xx^{li} for everie Tyme that they or anye of them do attempte the Contrarie thereof, the one half thereof to be to o^r saide Sovereaine Ladie and thother halfe to the said Maio^r and Coialtie & their Successo^{rs} to be recovered by Action of Debte, Bill, Pleynt, or Informacon, wherein the ptie Defendant shall not wage his Lawe, nor in the saide Action, Actions, or Suytes anye Essoyne Licence or Protection shalbe

allowed, The saide Maio^r and Coialtie gyving and payenge to the Lorde or Lords Owner or Owners of the Soyle where suche Things shalbe made or done, in Recompence and satisfaction of & for the Lande or Grounde so to be digged or myned, for the full & absolute Purchase of the same to them and their Successo^r so moche money as by the twoe Iustices of the Assise of the Countie of Devon for the Tyme being shalbe adiudged ordeyned and determyned. And also gyving and payenge to the Tennts Fermo^m and Occupiers of suche Lande or Grounde for suche Hurts or Losses as they or any of them shall have or susteyne by the same, as moche as shalbe assessed adiudged and determyned by the saide two Iustices of Assises, the same Recompence and Satisfaction as well concernynge the Lord or Lords of the Lande as the Tenants Fermo^m and Occupiers of the same to be paied by the saide Maio^r & Coialtie of the saide Boroughe for the tyme beinge or their Successo^r within the space of Sixe Weekes next after the ratinge assessing and determynenge of the same, unless the saide Maio^r & Coialtie & their Successo^r can otherwise compounde and agree wth the Lords Tennts Fermo^m & Occupiers of suche Lande and Grounde or with any of them, and in Case yt happen the Maio^r and Coialtie of the saide Boroughe do make Defaulte of Payment of the sayde Recompence & satisfaccon and resiste to paye the same as is before reserved, That then the Lorde Lords Owner Owners Tenants Fermo^m and Occupiers of suche Lande or Grounde that is aggrieved therewth and to whom the Recompence & Satisfaccon ought to be paied shall and maye Lawfullie comence affyrme & take his or their action of Debte by the course of the Comon Lawe against the Maio^r and Comynaltie of the saide Boroughe for the Tyme being and their Successo^r for recoverie of the same in any Courte of this Realme at the will and Pleasure of the ptie grieved, and the like Proces thereupon to be hadd, as in accoon of debte at the Comon Lawe grounded upon Contract or Specialtie hathe used to ben hadd, in whiche no Wager of Lawe Essayne or Protection shalbe allowed.*

Provyded allwies and yt is further Inacted by this present Pliament and by the authoritie of the same, that the said water shall not be conveyed throughe the House Garden or Orcharde of any pson or psons or throughe anye Parte thereof w^{thout} Composition to be firste hadd with the Owners and Occupiers of the saide Howses Gardens and Orchardes. Provided alwaies that this Acte nor any Thing herein conteyned shall extende to gyve Libertie, as aforesaid to bring the saide Water or anye Parte thereof owte of his auncient Course to or for any Intente or Purpose menconed in this Acte, unlesse everie suche pson and psons as are Owners of any Mylle or Mylles scytuate and standinge upon or nere the saide

* Charles II., by his Charter of 1680, granted the moiety of the penalty of £20 for interfering with the leat, here reserved to the Crown, to the Mayor and Commonalty.

Ryver of Mewe als Mevye shalbe first compounded withall as aforesaid, yf the sayede Milles shall by the bringinge of the said water or any Parte thereof unto the saide Towne of Plymowth be impayred or hyndered.

It is necessary to notice here, as having the most important bearing upon the motive which led Drake to interest himself in the matter, that the Act was not passed in the form in which it was at first introduced. Reference to Sir Simonds d'Ewes' *Journals* will show that in committee a proviso was added; and reference to the Act itself makes it clear that this proviso is the only part of the measure in which any allusion is made to the erection of mills, or which in any way can be construed to authorize the appropriation of the intended watercourse to that purpose. Power to erect mills therefore was *not* sought by the Corporation of Plymouth, but was added by the committee, the only member of which who had any connection with Plymouth was Sir Francis Drake, and he at that moment was lessee of the ancient manor mills at Millbay, which belonged to the Corporation.

The Corporation accounts are conclusive as to the means by which the Act was obtained, and whence the money came which paid for it. I first give the entries of expenditure in London.

Itm paide to Mr. Hele for his helpe att London for furtherenge of o ^r sute for bringinge in of the water as by his bill appeareth	ix ^{li} j ^s vj ^d
Itm paide to Mr. Christopher Harris for the helpe aboute the water as by his Bille appeareth	xvij ^{li} vj ^s
Itm paide to George Baron for his paines and charge in sollicitinge the Cawse for the Bringinge home of the water to the Towne w ^{ch} is enacted spendinge xxvij daies	vij ^{li}
Itm paide more for drawinge of the Acte manye tymes writen	ij ^{li}

George Baron was the Town Clerk, and was sent specially to London to "sollicit the Cawse." Both he and Hele, as officials of the Corporation, were paid for their services. Another phrase, however, is used with regard to the outlay by Harris. He is paid, not for "*his* help," but for "*the* help;" and his outlay was as much as that of both the others put together. If any doubt is felt as to the character of Harris's expenditure, possibly the following entry from the accounts of 1509-10 may supply a clue:

It delyuyd to John Bryan for harry Strete and hym
 beyng burges of plement for the towne for ther
 labor and Expences durynge the plement and for
 rewards and pleasurs gyven to dyus lords of the
 Courte to be fryndely to the towne . . . x^{li}

And there are numerous entries of this kind. Thus in 1541-2 a tun of wine, costing £5 6s. 8d., was given to the Lord Admiral to move the king for the discharge of the pension which Plymouth had been accustomed to pay to the Priory of Plympton.

There can be no doubt, I think, that influence was bought and paid for to further the passing of the Act; but there is no evidence that Drake exercised any beyond the matter of the proviso, and there is no need to assume that he was one of the gentlemen who, in plain English, was bribed. His reward came later in another and more substantial fashion.

Beyond the money laid out in London there were several local items of expenditure on the Water Act which are not without interest:

Itm paide for a supper for the Justices when they came to viewe the course for bringinge the water into the towne	xxxij ^s
Itm paide for victualls wine beare and other pvision carried from hence vpon the Downe	v ^s vjd
Itm paide for the hire of three horses att that tyme	ij ^s vjd
Itm paide to a poore man to shewe them the waye	xij ^d
Itm paide to Sprie the painter for riding to mevie aboute the water	v ^s
Itm paide for his horse hire then	xij ^d
Itm paide for Mr. Carewes diett when he rode aboute the water	ii ^s viij ^d
Itm paid to Sprie the painter for makinge of a plot of the Toune and parrishe w ^h a Bourder Carried to the Counsell	x ^s

The legitimate inference would seem that some of the local justices (had they been judges of assize Mr. Carew would not have been associated with them) viewed the proposed line of leat in order to report thereon to the authorities; and that they were strangers to it is shown by the hiring of "a poore man to shewe them the way." The Act cost the Corporation in all £39 17s. 2d., which is equivalent to nearly £250 of current money, a heavy charge for an unopposed measure, and a sixth of the total corporate income of the year.

These are all the contemporary references to the Water Act, and they show clearly enough that it was both promoted and paid for by the Corporation. It has, however, been argued that Drake was the real promoter, because the ostensible purpose of the Act is "the preservation of the haven of Plymouth." And undoubtedly this is a suggestion that might be entitled to some consideration, though utterly unsupported by evidence, if it could be shown that before his time the "haven" had been neglected. So far, however, is this from having been the case, that there are entries of proceedings by the Corporation of Plymouth against the tin streamers for choking the harbour long before he was born, and continuously thence at frequent intervals throughout the whole of his life and years after his death. Again, the "haven" of the Act is unquestionably Sutton Pool, the ancient harbour of the town, to which Cattewater formed the roadstead, and this had been under the care and government of the Corporation well-nigh a century before Drake saw the light; while the orders are still extant made by William Hawkins, mayor, John Fytz, recorder, and the "12 and 24" in 1568, for the "good kepyng of the poole and waterside under the full sea marke." What more natural than that this heedful care should be continued, and that an effort should be made to bring the "water of Mewe" to the town, with this object among o'hers, that there should be "some parte of the Chanell of the saide Haven scoured and cleansed." The seamen of Plymouth had not waited until Drake came, to teach them to learn the advantages of their harbour, or the way to maintain it in proper order.*

* It has been doubted that the Haven of Plymouth mentioned in the Act was Sutton Harbour. To this it is sufficient to reply that the word haven or harbour is locally used in several senses, each of which must be decided by the context. It is sometimes employed for the Sound and all its branches, sometimes for different parts only, and sometimes even has a wider meaning still; for there was a time when the Customs port of Plymouth included all the maritime towns of Cornwall. Leland limits the meaning of the word clearly to Sutton Pool, which is recognised indeed in the fourteenth century, not merely as the harbour, but the "port" of Plymouth, and there are frequent distinctions made between the harbours of Cattewater and Hamoaze and Stonehouse, all being parts of Plymouth Haven in the extended sense. Where, however, reference is made to the washings of tin works, it is always "the harbour of Cattewater and Cawse" (Sutton Pool) that is intended; and in the course of a dispute between Plymouth and Saltash, as late as 1635, the headland of Mount Batten is spoken of as dividing the harbour, not from Plymouth Sound, as now understood, but from the "mayne sea." And if the allusion to the damage caused by the tin works in the Water Act is not deemed conclusive, there is no evading the fact that the only part of the larger Plymouth Harbour "within or nere" the town was Sutton Pool, and that over this alone had the Corporation of Plymouth any jurisdiction, while a contemporary

Although the Corporation obtained powers to proceed with their project early in 1585, some five years elapsed before they made any practical attempt to carry it out. We are not surprised at this when we bear in mind that in the interim Plymouth had to play the leading part in the great struggle with Spain. A port that was expending its energies in sending out expeditions, and in preparing for the reception of the Armada, had little opportunity to deal with home affairs. Year by year plunged the Corporation more deeply into debt, until 1588 brought the expenditure up to £659 11s. 6½d., which was more than three times the ordinary outlay in time of peace.

However, in the mayoralty of John Blitheman (1589-90) the preliminaries of the actual work were commenced. The first entry runs as follows :

Itm pd for a staffe to [take] the levell of the water &
for mendinge the hedde, being broken and for
ledde vjd

The next brings Drake into the business, but only incidentally.

Itm paid for hire of a horse to buckland for Ratten-
burye about y^e water xijd

Rattenbury was a servant of Sir Francis, and Buckland is of course Buckland Abbey; but there is no clue as to the exact nature of the business on which Rattenbury was sent, or respecting which he was sent for. The only subsequent

map among the Cecil papers distinguishes Cattewater as "Plymouth Rode." The point is hardly worth elaboration, save as an illustration of the loose way in which the subject has been commonly treated. Moreover, the whole ingenious fabric of Drake's assumed unique patriotic scheming for Plymouth topples over, when it is found that in the same year a Water Act was obtained by the Corporation of Chichester, and that a Water Act procured by Stonehouse in 1593, with which no one has yet ventured to say that Drake was associated, makes precisely the same professions of national advantage, and is couched in almost exactly the same terms. There is no doubt that when the leat was first made, as the oldest leat map shows, the water was allowed to flow through the streets to Sutton Pool. It was, however, soon diverted to its present course to Surpool and Millbay. The ancient manor mills there are spoken of in a deed by Serjeant Hele, in 1596, as "the late salt mills;" and very soon after this we find the ancient mill-pool in process of reclamation. The most definite statements are, however, the entry, in 1598-9, of charges for "making" the leat by the middle mill; and in 1599-1600 of the payment of the large amount of £2 1s. 10d. to John Trounce for "alteringe of the watercourse by the East-gate;" that is to say, at Sutton Pool. By taking the leat to Millbay the old salt-water mills could be driven by its aid, and the mill-pool turned to other account; and whether this was done by Drake or not, as the holder of the lease, it was at least carried out within ten years after the water was brought in.

entry in the accounts of this year referring to Drake is somewhat more definite.

Itm pd Peter Vosper to goe to buckland to knowe
when the Judges did come xij^d

These were the judges of assize who were to assess the compensation to be paid to the landowners and tenants, and it is pretty clear that it was in the subsequent mayoralty they paid their visit, when we find the entry.

Itm paid to Peter Sylvester for a tonne of wyne w^{ch}
was given the Judges for their paines and helpe
touching the water Course xx^{li}

Blitheman's mayoralty seems indeed, so far as the water was concerned, to have been wholly occupied in preparations. First one Burden was sent out to Meavy to make some investigations.

Itm pd to Thomas Burden for ij horses hire to mevye
for vewe of the water xx^d
Itm pd att the Church howsse of mevye for wine &
milke ij^s vj^d

And then we come to a highly interesting set of extracts, giving the name of the original "water engineer" and his assistants.

Itm pd Robart lampen for Plⁿnynge & vewinge the
grounde for the water Course from mevie for vj
daies x^s
Itm pd haywoode for vj dayes & newe writinge the
vewe iiij^{or} tymes viij^s vj^d
Itm pd nicholas Jeane for iiij^{or} dayes iiij^s
Itm for their dyett viij^s vj^d

This Robert Lampen, by the way, was a member of a family long resident at St. Budeaux, and still represented in Plymouth. A Robert Lampen is mentioned in 1566 in the St. Bude Register as the father of another Robert, who was baptized July 25th in that year. And one of these was unquestionably the surveyor by whom, and not by Drake, as in the absence of the original record was so long imagined, the Plymouth Leat was planned. If the father, he was at least fifty-three years of age; if the son, he was not more than twenty-three. Whichever it was, he was accustomed to surveying work; for in 1592 he helped Robert Adams, who had been sent down by the Privy Council to advise concerning the fortifications of the town. We shall see by-and-by

that Lampen was aided in subsequent work upon the leat by his brother; and if it was the younger of the two, this must have been James Lampen, baptized July 2nd, 1571.

But the most important record of this year is not to be found in the Receivers' Accounts, but in far more formal fashion among the entries of important events in the Corporation "Black Book" or "Toune Ligger: "

Also this yere the composyton was made betweene the towne and S^r Frances Drake for the bringinge of the River of Mewe to the towne for w^{ch} the towne have paid hym ijc^{li} and more c^{li} for w^{ch} he is to compounde wth the lls: of the land over w^{ch} it runneth.

It must have been very late in Blytheman's mayoralty that this "composyton" was made, because it is not until the following year (1590-91) that we find the drawing up of the "contract"—for such here is the precise meaning of "composition"—paid for.

Itm paid to m^r heles man [Hele was now Recorder]
for wrytinge owte of the articles of agreement
betweene the towne and S^r Francis Drake . . . vj^s viij^d

The "composition" itself has been diligently sought for, but cannot be found; and the probability is that it was one of the documents destroyed under the circumstances indicated in the following entry, under date 1601-2:

Itm rec of Nicholas Goodridge of Totnes m^rchaunte
vppon an agreement made between the Towne &
him for an offence Comitted by him the said
Nicholas in burning of a Cheste in the Councill
Chamber wherein were Contayned divers evidences
and writings Concerninge the Towne . . . c^{li}

And it is a fact worth noting, that there is one document among the Corporation muniments referring to the water that has been partially burnt.

However, concerning three points at least there can be no honest dispute. First, that Drake's association with the water was under conditions duly set forth in a contract, and therefore of a strictly business nature. Second, that he had £200 for the actual carrying out of the work. Third, that he had £100 additional to pay the compensation for the land. That is to say in modern money at least £1,500.

And whether the work upon the leat was actually begun in Blitheman's mayoralty or not, there is evidence that the

Corporation had begun to raise the money for the purpose in the entry :

More to deduct owte of this Charge for monye by m^r
Blitheman rec of Richard hawkins in parte of
paimnt of l^{li} given towards the bringinge in of
the water w^{ch} xv^{li} the towne standeth indebted to
the water xv^{li}

All the entries of payments for work actually done fall within the mayoralty of Walter Pepperell (1590-91), in which year we have also the entry in the Black Book :

This yere on the* daye of December S^r Fraunces Drake
Kneight beganne [the River†] to bringe the Ryur Mewe to the
towne of Plymouth w^{ch} being in lenght about 25 myles he wth
greate Care and diligence [p^rmed†] effected and brought the Riur
into the towne the xxiiijth daye of Aprill the next after p^rsentlie
after he sett in hand to Builde sixe greast mills two at wythy in
eck buckland p^h thother 4 by the towne the two at wythy and
the two next to the towne he fullie fynished before Michaelmas
next after and grounde Corne wth theym.

Before I make any comment upon this, I will quote the entries in the Receiver's Account of the year precisely in the order in which they stand :

Itm paid for provision when the mystresses Rade first to vewe the water Course	iiij ^{li} x ^s viij ^d
Itm for the hyer of a horse for a Trumpeter to Ryde in compayng to the Riv ^r	xij ^d
Itm pd to 4 trumpeters that were att the leate by Mr. Maiors comāundemt	v ^s
Itm pd for horses for theym	iiij ^s
Itm to a messeng thatt was sente to S ^r Fraunce Drake	xij ^d
Itm to a messenger sent to m ^r harrys	xij ^d
Itm for hyer of two horses to Carry provisions to the leate	ij ^s
Itm for bredd carryed to the leate	vii ^s
Itm p to m ^r Whitakers for wyne to Carry to the leate	xl ^s vj ^d
Itm for other pvisons sente the same tyme	xj ^s ix ^d
Itm to Henry Ellys for a dozen of bredd spente at the S ^r vaye of the water	vij ^s
Itm to John Hoop to Carry owte plancke to make the bridge att mawdlyn [near Mutley]	iiij ^d
Itm paid to workemen to make the bridge	iiij ^s

[There are also entries of the cost of the materials—a beam cost 2s., and other plank 5s. 6d.]

* Blank in original.

† Erased in original.

Itm given to Robert lampyn in reward at the bringinge in of the leate	ij ^s vjd ^d
Itm pd for x pounde wayghte of powder thatt was spente att the bringinge in of the Riur ^r	xvj ^s viij ^d
Itm to John Rewbye for a dynner att the bringinge in of the Ryu ^r	xvj ^s
Itm to the gunn's thatt daye	xvj ^d
Itm more spent vpon theym then	iiij ^s iiij ^d
Itm to Willyam Stockam servaio ^r of the woorckemen of the leate in rewarde	xij ^s
Itm to the pson of Meavye in Clothe asmuche as cost	lj ^s
Itm to John Stevane one other S ^r vaio ^r of the same woorcke	xiiij ^s
Itm given to the ij lampyns in reward touching their paines taken about the leate	xxvj ^s viij ^d
Itm given to Robert lampyn and his brother in reward for their paines about the water	xxvj ^s viij ^d
Itm paid over and above the Charges in this accompte before mentyoned w ^{ch} amountethe to xvj ^{li} xvij ^s ij ^d for and in bringinge in of the leate and beside the money given S ^r Fraunces Drake the some of, as by a bill of p ^t iculers appeared the some of	xlviij ^{li} viij ^s vij ^d *

Is it possible with any show of reason to mistake or to ignore the plain purport of these statements? We have here distinct proof that, in addition to the works executed by Drake, there were others performed by the Corporation at a considerable outlay. We find the Corporation also acting as the hosts and employers when they celebrated at the Head Weir or somewhere at a distance, the completion of the undertaking,† rejoicing—in defiance of all “tradition”—not over the arrival of the water in the town, but its entrance upon the channel cut to convey it thither. The rewards to the “parson of Meavy” and to the two “Surveyors of the work”—the foremen of the two gangs by whom the leat was made—all show the direct interest taken in the actual construction of the watercourse by the Corporation; and as if to set beyond all doubt the fact that it had been made after the plans prepared by Robert Lampen, we have the entries of the

* There are other entries in this year connected with the water, but having nothing to do with the leat. Thus £39 15s. 2d. was paid for “lead for to Conveye the water, 99^{ch} 16 att viij^{li} the tonne,” and one “Moore the plumber” had £15 for his labour, besides 3s. for wine and 5s. “toward his charge cominge hither.” The lead pipes were stored with one “Mathewe Starkeys wyfe,” who had 8d. a week for “selleradge” from September 17th, 1591, to September 16th, 1592.

† The entry concerning the “mystresses” is a very curious one. It reads very much like the provision of an official picnic for the wives of the Aldermen “or masters.”

rewards given to him and to his brother for the pains they had taken, with the special mention of Robert himself. These rewards are of course gratuities; and if they appear small in amount it is only because in the course of time there has grown up a wonderfully exaggerated idea of the real character and extent of the work done.

Before commenting further upon these entries it will be advisable to complete the series, so far as they relate to the outlay on the construction of the leat, by quoting from the Receivers' Accounts of the two succeeding years. We have in 1591-2

Itm rec of Diu's parsons [persons] toward the charges of bringinge in of the water ouer and aboue that w^h hathe byn paide owte to diu's psons vppon soundrie reckninge w^h ought to be paied, whereof mentyon is maide in a bill of the pticulars thereof iiiij^{li} xvij^s

Itm pd for makinge of the brydge by the mylles & other worke viij^s

Itm paied to S^r Frauncis Drake, kneight, towarde the bringinge in of the water w^h the Receavor allowed him in his rent dewe for the milles for one yere att Michelmas 1592 xxx^{li}

Itm rec of William Browne [Receiver of the previous year] for y^t w^o he was sett to paie toward the bringinge of the water v^{li} and for monyes that he receaved of the water monye more then he hath accompted for all amounting to xxv^{li} iij^s xj^d

And in the next mayoralty, that of [Sir] John Gayer, 1592-3:—

Itm paied to S^r Frauncis Drake, knyght, in full paiment of the ccc^{li} thatt the Maio^r and Coaltye were to paye hym for bringinge of the Riu^r and prehas of the land ou^r w^h the same is brougte which is allowed owte of the mille rent w^h was payable this yere xx^{li} xvij^s viij^d

We have here direct current evidence of the expenditure by the Corporation "upon the water," in addition to the money laid out upon works of distribution in the town, of £488 11s. 6d., and of the payment, under the composition or contract, of £300 of this sum to Sir Francis Drake—£200 for "bringing in the water" and £100 for compensation to the landowners. It is idle to attempt argument with any one who believes these official entries to be fictitious; but

when they are accepted, as they must be, by all who have any pretensions to judge of the value of historical evidence, the further question necessarily arises, Were they adequate to the end attained? Is the outlay sufficient to account for the work done, without paying in aid any extraneous help? It cannot, as we have seen, be denied by any process short of a headstrong disbelief that would make doubtful the existence of Drake himself, that whatever he did was done under contract with the Corporation, and that under this contract he received £300. We will separate the question of the construction of the leat from that of compensation, and enquire in the first place whether £200 was sufficient pay for making the channel.

Now the answer to this question is not so difficult as it at first may seem. The leat, as we learn from the Act, was a "ditch or trench" dug in the ground, between six and seven feet in breadth, and banked up along its course with the material excavated. Its length is variously stated. The entry in the Black Book already quoted makes it 25 miles. A contemporary map, in the collection of the Marquis of Salisbury, puts it at 27 miles, "after 1000 paces to a mile and fyve foot a pace." Elsewhere I have seen it given at 30. Now where authorities differ so materially, the only safe course is to have resort to original investigation. The leat follows the same course now as it did in the days of Elizabeth. We measure it, and find it is not thirty miles in length, not twenty-seven, not even twenty-five, but only seventeen; and we are satisfied that, however written records may blunder, the leat itself can tell no lie.

Hardly can a simpler arithmetical problem be propounded than the quantity of excavation required for the formation of such a water course as that which we have before us; and having the quantity we can at once ascertain the approximate cost. The leat, as it now exists, with its carefully banked and built sides, is the result of nearly three centuries of improvement and repair, and of the expenditure of thousands of pounds in maintenance and improvement, but there are still portions remaining which show very clearly that its original character was that of the "ditch or trench" authorised. To construct such a trench, averaging six feet in width and two feet in depth, allowing for sloping sides and the occasional increase of depth by embanking, would not involve 2000 cubic yards of excavation per mile. Indeed, making allowance for the facilities afforded by the frequent hill slopes, 1800 would

suffice. To be on the safe side we will, however, take the 2000, which would give us for the whole leat 34,000 yards. One of the highest authorities upon the execution of earth-work in the West of England tells me that a man might be expected to dig and throw to one side (and none of the material had to be carried away) eight cubic yards of such material per day. According to the entry in the Black Book whatever Drake did was done in less than five months, or say twenty weeks.* The whole of the work therefore was within the capacity of 36 men working that period.

And now comes the question of cost. As to this we have ample data. The average wages of a working tinner or "spader" —the class of men that would be engaged in this operation—in the reign of Elizabeth was but 2s. a week. Even less than this is given by some contemporary authorities, and all agree in describing the lot of the working tinner as unequalled in hardship and poverty; while it was one of the proudest boasts of Sir Walter Raleigh that he as Warden of the Stannaries had increased the 2s. to 4s. So far as Plymouth (where the wages were higher than in the country) itself is concerned, the point is settled by entries such as these:—1591–2. Six days pay to two men that served the paver, 4s. 4d., *i.e.* 2s. 2d. each per week; three labouring men six days, 12s., *i.e.* 4s. per week; four labourers five days, 13s. 4d., *i.e.* also 4s. per week. In the next year masons were paid 9d. each per day, while in 1596–7 a carpenter had 1s. 1d. Four shillings a week is thus the highest wages quoted for ordinary labourers in the town, while the average of town and country would be about three.

The wages of 36 men for 20 weeks at 3s. each man per week are £108. But I have here overestimated both the work done and the wages paid, and the fact is really beyond reasonable controversy that the excavation of the leat for the whole distance in ordinary ground could have been accomplished in the days of Elizabeth for £100.† As Drake received £200, it should be clear that he did not make an unprofitable bargain.

But it has been objected that the work may not have been of the straightforward character here premised, and attention has been called to a remarkable statement in Westcote that Drake carried the leat "with greatest labour and cost through a mighty rock generally supposed impossible to be pierced . . .

* And this one fact of course negatives utterly the idea of the magnitude of the undertaking, which has misled unenquiring minds.

† We get the same result, essentially, if we reckon the excavation at modern prices, and reduce them to the Elizabethan standard of money value.

like another Hannibal making way through the impassable Alps ; " which Risdon repeats with the variation " through . . . one main rock thought to be impenetrable."

Now it has always been a difficulty with those who have thought about the subject, that from the beginning of the leat to its termination there is no tunnel, no "main rock," and, I may add, no Alps for an English Hannibal to overcome. In such a case we have the plain choice before us, to believe the chronicles and disbelieve our eyes, or to believe our eyes, and charitably presume that the marvel-maker was only mistaken. It has been however sought to find a middle course, and to identify with this "mighty rock" some works of improvement on Yannadon Down, which unfortunately for the hypothesis the accounts of the Corporation show were carried out early in the last century. The origin of this strange statement therefore remained wrapped in obscurity, until a memorandum was found on the Cecil map of the leat already cited, which had not been observed on its duplicate in the British Museum—a note at the Head Weir: "Here the river is taken out of the old river & carried 448 paces through mightie rockes which was thought impossible to carrie water through"—"huge rockes" themselves being depicted as commencing less than a mile off. At once the mystery was solved, and the source of the blunder into which Westcote or Risdon had fallen, to the misleading hosts of credulous followers, was explained. The mighty rock disappeared and the huge rocks took its place, and their site was at once recognized in the loose bouldery ground near the source of the leat, through a portion of which at least down to long after the time of Drake, the watercourse was partially protected by wooden boarding. A careful survey of the course of the leat will show that, with this exception, the work to be done was of the ordinary character involved in my calculation of the cost; and whatever extra outlay there may have been in this 448 paces, it must have cost as much as the remaining sixteen miles and three quarters, to have rendered it necessary for Drake to put his hand into his own pocket as well as into that of the Corporation.

In my desire to state the case as strongly as I can against myself I have up to this point assumed that the whole of the work was done by Drake. This however is precisely what did not happen. Let me call attention to the fact that in 1590–91, beyond the specified payments in connection with the celebration of the completion of the undertaking, there is a general entry of the payment upon a bill of

particulars shown at the time, "for and in bringinge in of the leate," of £47 8s. 7d. If words have any meaning this was for actual work done, and to this extent therefore Drake must have been relieved. Read this charge in connection with the alteration of the record in the "Black Book"—an alteration made at the time of entry with the evident intention of being exact—the alteration from the statement that Drake "beganne the River" or leat, to "beganne to bringe the Ryu^r Mewe to the towne;" and the minor change of the adoption of the word "effected," instead of "performed;" and you see how carefully we have been guarded against the idea that the undertaking was his alone.

But we can go further still. Not only is the course of the leat 17 miles, and not 25, much less 30; but for about half of its course it is simply the utilisation of an older leat conveying water from the Meavy to the ancient seat of the Copplestones, now of the Radcliffes, at Warleigh, and called the Warleigh Mill Leat.

This is a statement that can be established from various sources. I am not one of those who either accept or doubt tradition simply as tradition; though it is a notable fact that the constant tradition of the residents at Sheepstor and Meavy (whose ancestors were engaged on the work) has been that Drake did not make a new channel, but adapted an existing one. An old man named Giles, better versed in the legends of the country-side than any man now living, who died a few years since at an advanced age, very strongly insisted upon this as the story that had been handed down by his forefathers. If the tradition stood alone, however, genuine as it seems, I should not be inclined to press too heavily upon it. Fortunately it is only one witness out of several. Next in importance comes the actual existence, in partial independence, of the Warleigh Mill Leat itself, in the shape of a stream of water issuing out of the Plymouth Leat near Roborough Mills, and flowing thence to Warleigh, a distance of some four miles, and distinguished from certain supplies afforded from the leat to the estates of Whitleigh, Manadon, and Ham, through or by which the leat passes, by the fact that payment is made to the Corporation; whereas the other properties enjoy their supply free, in payment or part payment, as it has been always understood, for the land taken. And it is furthermore a very curious fact, which a practical engineer will at once appreciate, that the section of the leat from the Head Weir to Roborough Mills, where the War-

leigh stream branches off, is a much ruder work than that from the mills into Plymouth; and still retains, after centuries of improvement, much of its original character of an ancient pot-water stream, of which there are several of great antiquity, and of considerable length, in the immediate neighbourhood. This is perhaps best seen, as I have elsewhere shown, in a remarkable bend at the entrance of the leat upon Roborough Down, about six miles from the Head Weir, where a surface detour is made three-quarters of a mile to avoid a cutting which would not exceed ten feet, the straight course not being more than a quarter of a mile. It is impossible to believe that either Lampen or Drake beginning *de novo* would have made such a circuit; and manifestly we have here the simple difficulty-avoiding line of the old stream. So the course thence to the Roborough Mills is not that which would have been taken if Plymouth and not Warleigh had been in view.

The documentary evidence of the existence and character of this Warleigh Leat is quite as important as the traditional and physical. In the oldest extant record of the high rents of the manor of Sheepstor, of which Mr. John Bayly is the lord (1751), there appears by recital from older documents, "Another acknowledgment of one penny payable by Walter Radcliffe, Esq., for the running of Warleigh Mill Leat into Meavy River above Plymouth Leat headweare." And this at once fixes the position of the Warleigh Mill Leat; for the only stream that "runs" into the Meavy above the Plymouth Head Weir, with which either Warleigh or the Radcliffes could then or now have anything to do, is the Plymouth Leat itself. Observe that "running into" is here used of the channel, not the stream, precisely in the same way as we speak of putting a gas or water service *into* a main. And we do not stop here. Originally the acknowledgment from Warleigh to the Plymouth Corporation was an annual buck; but when deer ceased to be kept a guinea was substituted, and the first entry I have been able to find of the money payment states that it is an acknowledgment for a stream of water taken out of the Plymouth Leat in lieu of Longstone Mill stream. The Longstone stream is a long-abandoned mill leat taken from the Meavy adjoining the Head Weir; and although we cannot perhaps expect absolute exactitude of detail concerning a payment in kind commuted, and first becoming a matter of account, some two centuries after it originated, the important point here is the confirmation of the statement that the Warleigh supply originally came

from the Meavy direct, in which case its following the line of the Plymouth Leat really amounts to a physical necessity. My last piece of documentary evidence is specially important as carrying back the existence of the present Warleigh water supply to within living memory of the construction of the leat—a letter addressed by Mr. C. Bampfylde of Warleigh to the Corporation in September, 1679, complaining of the hindrance of his supply, and desiring that the same stones should be put up in the leat to bring the water to his house.

I confess that for my own part I do not see how the evidence for the existence of this Warleigh Leat, and its partial adaptation for the line of the Plymouth Leat, can be resisted; and as the unappropriated amount expended by the Corporation would be sufficient to have formed the really new portion of the leat from Roborough Mills to Plymouth, it seems a fair inference that this was what the Corporation did do, and that Drake's share of the work was the enlargement of the Warleigh Mill Leat, to render it adequate to the wants of the town and the driving of the mills which he had it in purpose to erect. It is certainly a very remarkable coincidence, if nothing more, that while the unappropriated amount spent by the Corporation "for and bringinge in of the leat" was £47 8s. 7d., the cost of cutting the eight miles from Roborough to Plymouth on the basis already given would be £48.

It is not necessary, however, as I have already shown, to insist either upon the performance of any portion of the work by the Corporation, or upon the adaptation of the Warleigh Mill Leat, to prove that Drake was amply paid for his four or five months' winter's work—a period, moreover, as we have seen, altogether too short for the performance of any of the gigantic details assumed by credulous imaginations. He may have had a margin of profit of £100, but direct profit of some sort there must have been out of his £200.*

We now pass to the question of payment in compensation, and here we have no need to frame any theory or draw any inferences. Drake had £100 to "compounde wth the lls. [lords] of the land over w^h it [the leat] runneth." A contem-

* It is worth adding that in 1823 Mr. R. Hopkins proposed to bring a supplementary stream six miles from Sampford Spiney to Dowland Barn at a cost of £500, and that upon this basis of calculation, again, the recorded payment to Drake by the Corporation is fully sufficient for the work. So with regard to Hopkins's estimate of 4d. per cubic yard for the excavation of a reservoir at Roborough.

porary copy of the deed of composition is among the muniments of the Plymouth Corporation, and sets forth the sums assessed in full detail. The total is £60 4s. 4d., of which £33 19s. 4d. is for the purchase of the soil, and £26 5s. for the tenants. Here also, therefore, Drake evidently netted a very handsome profit.

The document is too long to quote in its entirety,* but it gives the name of every landowner and of every tenant interested twice over—first in the recital of the land taken, and then in the award—in due order from the commencement of the leat to its termination, and citing in several instances the names of the estates. The amounts throughout are stated to be calculated “after the rate of xvj yerres pchase according to the verie value;” and each award is specified to be made “for all the Lands and groundes of” each owner “in the possession” of each tenant, “digged mined or turned or anie waie delt wth for the convayeng or bringing of the said water course.” It commences in the following terms :

This Indenture made the fuethe daie of Julye in the fower and Thirthith yere of the Raigne of o^r soueraigne Lady Elyzabeth by the grace of godd Queene of England Fraunce & Ireland Defender of the faithe &c. Between S^r Edmond Anderson Knighte lorde cheyf Justice of the Courte of Comon pless, and Thoms Gente stroud Baron of her Ma^{ty} Courte of Exchequer Justices of Assise of the Countie of Deuon of thone partie, and the Mayo^r and Coialtie of the Boroughe of Plimouth in the said Countie of thother partie, whereas it was enacted in the Parliam^t holden in the seauen & Twentithe yere of the Raigne of o^r said sou^raigne Lady—

Here the chief provisions of the Water Act are set forth.

And whereas the said Maio^r and Coyaltie after the said feaste of Easter haue digged mined and trenched and caused to be digged mined and trenched one ditche or Trenche containinge in breadthe betwene sixe and seuen foote in over and throughe the Lands & grounds lyeinge betwene the said Towne of Plymouthe, and some pte of the said Riuer of Meawe als Meevye, and digged mined broken banked and caste vppe all manner of Rocks stones grauell sande and all other letts in the groundes and places convenient before mencofied, for the conveyent or necessarie conveyeng of the said Riuer to the same Towne of Plymouthe pte of w^{ch} Lands & grounds soe digged mined trenched is thinheritance of Walter Elford gent beinge in thoccupacon & possessione of one Willm Stockenian and ouer and throughe the Lands & inheritance of the said Walter Elford and of Thomas Elford beinge in the possession & occupacon of one Walter Elford John Elford and Johan Sop—

* A full abstract will be found in the *Plym. Inst. Trans.* viii. 520-26.

widdowe tennts or farmo^r of the same eyther solie to themselves or ioyntlie or in Comon w^h some others, and ouer & through certen Lands & grounds, &c. &c.

Then the list of owners and tenants is given after the same form, and next, at the conclusion of the recital, the awards.

Theise Indentures nowe witness that the said Justices of the Assise hauing considered of the said Statute and of the quantitie qualitie nature and goodenes of the grounde ouer and throughe w^h the same is broughte to the Towne of Plimouthe ptelie by theire owne vewe and by the credible informacon of Christofer Harris Thoms Wise Willm Crimes John Coplestone, and Willm Strode esquires inhabyting neere to the said water course and most of them Justices of the peace in the said Countie of Deuon whom the said Justices of Assise required to vewe and meashre euerie part of the Land and to Consider of the valewe and goodenes of the same throughe w^h the said water course is brought to the said Towne of Plimouthe as by the informacon of diuerse gentlemen and others of goode accompte dwelling neere the saide Towne of Plimouthe and water course doe adiudge and determine that the said Maio^r and Coialtie shall paie to eurie persone hereafter recyted or menconed in recompence and satisfaccione of and for all the Lands and grounds digged mined, or torned or anie Waie delt w^h according to the said Statute for the absolute purchase thereof to the said Maio^r and Coialtie and to theire Successors for euer suche some and somes of monie and in suche manner and sorte as herafter shalbe specified. That is to saye to the said Walter Elford iiij^d and to the said w^m Stockeman * and his Colessees eyther joynctlie or by the waie of Remainder if there be anie iiii^d being after the Rate of sixteene yeres purchase, according to the value, and for other the Lands and grounds of the said Walter Elford and the said Thoms Elford being in the possessione of the said Walter Elford digged mined or torned or anie Waie delt w^h for the conveyeng or bringing of the said water course, (to weete) to the said Walter Elford iiij^s viij^d, and to the said Thoms Elford iiij^s viiiij^d and to the said Walter Elford and to his Colessees eyther joynctlie or by the waie of Remainder if there be anie ix^s iiij^d being after the Rate of sixteene yeres purchase according to the verie valewe, &c.

Here follow the detailed awards, the document concludes :

And to the entent that all and eu'e psone and psones shall and maie haue recompence and satisfaccon for anie dammage vnto him or them for the digging mining turning or dealing w^h anie pte of his or their Lands or possessions and for that it maie be that some one or more pcells of lande and the psones owners and lessees of

* It is worth noting that William Stockam was a foreman of one of the two gangs by whom the leat was made ; and that John Stephen (the name of the other foreman), appears as a tenant to "Askett, esquire," adjoining the present Roberough Down. Both lived on the line of the Warleigh Leat.

the same are lefte owte and not menconed in theise psents wee doe farder aiudge and determine that all and eurie suche parsones and psones shall haue recompense and satisfaccon for the same Lands soe digged mined turned or anie ware delte wth for the making and convayeng of the said water course after the Rate of xvj yeres pchase according to the verie value of the Lande to be rated taxed and appointed for the Justices of Assise of the Countie of Deuon for the time being Provided alsoe and wee doe further aiudg and determine that if it shall hereafter appeare, that anie pte of the Lands before resyted be thinheritance of anie other pson or psones or in lease to anie other pson or psones then before is menconed, and not thinheritance and not in lease to the pson or psones before menconed, soe that noe recompense or satisfaccon ought to be made vnto them, that then the Recompence and monie appointed to be paied vnto them by theise psents shalbe paied and satisfied vnto the trewe owners and lessees of the same according to the terme and seu'all Rates before menconed And that the said psones that be not owners or lessees before menconed shall haue nor take anie thing by theise psents anie thing herein contained [*to the*] Contrarie notwithstanding And we doe further——— and determine (?) that all and eurie pson and psones that are——— psents they receaue anie monie that they vpon the Recete of——— shall make acquittance or some other svffycient——— In witness whereof the said Justices of Assise——— aboue at the Assises being holden and——— thone pte of theise Indentures haue putt —— to thother pte the sd mai^r and —— theire Comon seale.*

To the ordinary mind this document, which moreover has been admitted as evidence of the purchase of the lands by the Corporation in a court of law, would appear conclusive. It is the result of the personal investigation of the Judges, Sir Edmond Anderson and Thomas Stroud (paid, as we have seen, for their pains with a tun of wine); of the credible information of a commission of county justices and resident land-owners—Christopher Harris, Thomas Wise, William Crimes, John Coplestone, and William Strode, who had “viewed and measured” every part of the land taken, and considered of its “value and goodness,” and some of whom were personally interested; and further, of “the information of divers gentlemen and others of good account dwelling near the said toun of Plymouth.” It sets forth the name of every owner and every tenant; it assesses the compensation to be paid to each individually, at sixteen years’ purchase according to the “very value.” It provides against the occurrence of errors, and for the compensation of any who had been accidentally omitted. We cannot conceive a document drawn up with

* Portions of the last folio are torn off.

more painful accuracy and scrupulous exactitude. Unfortunately it cannot be made to fit in with the modern tradition of Drake's generosity; and so as an attempt to deny its authenticity has failed, it has been asserted that it is of a bogus character, that the amounts given are merely fictitious figures in the nature of peppercorn rents, and that it is an ingenious device to conceal the sums that actually did pass!!

It should be sufficient to reply that no instance can be shown of a legal fiction of this complicated character, worked out with such minute detail; in which, not once or twice, but scores of times, the amounts given are stated to be the "very value;" and which could not have been intended to deceive anyone, seeing that all who were interested in the transaction were parties. If we are not to believe that a document of this character means what it says, there is an end to reliance on documentary evidence altogether.

But we need not rest our case here. Fortunately the award will stand any test that we may apply. The first, and most important, point is the adequacy of the amounts cited to pay for the land taken, for the whole allegation of fiction rests upon the assumption that they are not; and it is sought to establish this from the smallness of the figures, especially in the cases where 4d. is the amount named.

I have taken some little pains to go through the award, with the object, so far as possible, of distinguishing the different properties affected, and of ascertaining the rate paid per acre; not merely in gross, but in detail. A very simple arithmetical calculation will show that the total quantity of land required for the construction of a watercourse seven feet wide and seventeen miles long would be under fifteen acres. As the total cost of the land was £33 19s. 4d., this would be at the rate of £2 3s. an acre, or in modern value about £11 15s.

I admit that this is a small amount, but still it is not nominal, and considerably more than peppercorn. When, however, we come to examine the items in detail, we find that they work out in a very remarkable way, and in a fashion only explicable if the very value was really taken, and if the assessors really did consider, as they aver, the actual "value and goodness" of the land. A reference to the Act will show that the bulk of the land required was of very little value: "The moste Parte—in effect all the same Lande is either barren and heathie or ells hillye & drye grounde;" while we can see for ourselves that even at the present day this is true

of the land along the greater part of the course of the leat, from the Head Weir into Roborough. Now the manner in which the award is drawn enables us to ascertain that the amount paid for the land in this section of the leat—practically half its length—was £10 0s. 8½d., or £1 6s. 6d. an acre; that is, in modern value, £7 15s. And this includes the land taken on Bickleigh, otherwise Roborough Down, Hennadoune (Yannadon), and Roborough Down, commons so utterly valueless that they had no tenants.

If, however, we take the other half of the leat—from Roborough into Plymouth—we find that the compensation awarded was £23 18s. 7½d., equivalent to £3 4s. per acre, or, in modern value, £17 12s. This section includes only one common, that of Widey, all the rest being enclosed ground.

And we can carry the process a step further by again dividing this last section into two. We then find that for the portion from Roborough to Pennycross, in which Widey Common was included, the compensation was £11 2s., equivalent to £2 19s. per acre, or some £15 15s. But for the last quarter, that nearest the town of Plymouth, then, as now, the most valuable, the compensation was £12 16s. 8d., equal to £3 8s. and £18 14s. per acre in ancient and modern value respectively.

These, of course, are the averages, but much higher figures were paid in some cases. For example, Prowse, of Pennycross, for about two acres, had £8 9s. 8d., equal to a present value per acre of £23.

One other point has to be borne in mind. Land now fetches commonly 25 to 30 years' purchase, against the 16 of Elizabeth; and if at the present day compensation for compulsory rule and disturbance is paid to the owner, in this case it went to the tenant, in addition to the price of the land, the interest of the occupier being regarded in nearly every instance as equal to that of the lord, so that the prices noted above may practically be doubled. And that the rental value was liberally construed is shown by the fact that the average rent in 1630 of good lands at Lipson, and within the precincts of Plymouth, was but 3s. 6d. an acre, which at 16 years' purchase would make the acre worth only £2 16s., or at the outside, in modern money, some £15; and this is below the figure paid for all the lands within the cultivated area.

It will thus be seen that the figures of the award are perfectly adequate to its object, and that their variations are only consistent with a careful estimate of value having been

made, as explicitly stated, in each individual case. The only seeming exception is the proof of the rule—the awards of several sums of 4d. in respect of portions of the worthless common lands. It was necessary, to convey title, that some payment should be made, and a farthing a year was the only sum that could represent what was practically worthless. When the best land let at 4s. an acre, land of this class had really no assessable value; and since an acre would make more than a mile of the leat, what no doubt may have been a difficulty to some is explained.

Up to this point, therefore, I consider four things proved.

1st. That the waterworks scheme originated with the Plymouth Corporation.

2nd. That the Corporation obtained and paid for the Act.

3rd. That the Corporation paid all the charges for the construction of the leat, the £200 given by them to Drake being sufficient for that purpose, independent of their own outlay.

4th. That the Corporation paid for all the land taken, and compensated all the occupiers.

But we have not quite done with this last point. The Corporation undoubtedly gave Drake £100 to pay charges which it was eventually found amounted only to £60 4s. 4d. It is equally clear, however, that Drake left some, at least, of the awards unpaid, and that the Corporation had to find the money twice. Some of the awards appear to have been paid in kind—the rights of water supply enjoyed from the earliest time by the estates of Whitleigh, Manadon, and Ham—but this, while it enabled Drake to effect a saving, did not cast any fresh burden upon the Corporation. It is quite, otherwise, however, with the payments involved in the following entries :

- | | |
|---|------------------------------------|
| 1604-5. Itm p ^d for an Ordynarie to Bentley vpon
the Comysion betweene the Towne and S ^r
Thomas wyse | xvij ^s x ^d |
| 1605-6. Itm p ^d for a dynner for S ^r Thomas Wyse
knight [Lord of Stoke Damerel] and others w ^{ch}
came aboute the water Course | xviij ^s |
| Itm p ^d to Robte Trelawney for three hoggsheds of
Clarett wyne geuen to S ^r Thomas wise knight
for the soyle in the leate in his Orcharde at Stoke
Dam'ell thorough w ^{ch} the Towne Water is Con-
veyed, and for his right in the wast grounde and
Key by the Barbican | xiiij ^{li} x ^s |

1606-7. Item p^d for two hoggesheds of Clarett wyne sent to S^r Thomas wyse knight in full payment of the Composition betweene hym and the Towne for the soyle of his lande in the water Course and his right in the groundes & soil of the south-side key viij^{li}

And then we have in 1607-8, agreement to make the payment having been come to in 1603-4:

Itm geuen to M^r Walter Elford one hundred of deale Boardes w^{ch} are delive'd and also his freedome for y^e absolute inheritance of the hedd weare in the Ryver and the water leate of the water of meawe als meavy that runneth thorough his lande towards Plymouth w^{ch} Boards cost iiij^{li} xiiij^s

It is surely sufficient upon this to point out that both Wise and Elford appear on the award; Wise, moreover, being one of the Commissioners by whom the assessment was made. Nor were these the only sums paid by the Corporation. There is yet extant an original receipt for the payment to William Creese on the 28th October, 1594, by the "Maio^r and Coalty of the Borough of Plymouth by hands of William Stallinge, gent, the sume of xj of lawfull money of Englon^d in full recompense and satisfacon of all sum and sumes of money as is by theym payable or due to be payed to and for that pt of the Ryu^r of Mevy which is brought to the towne of Plymouth ou^r my grounds lying in the pish of Buckland aforesaid, and is the inheritance of Phillipp Crymes, gent." *

If any reliance is to be placed upon contemporary and official documents (and I have up to this point adduced *all* that are known to exist), there cannot be the smallest ground for the assumption that Drake was actuated in his connection with this business by motives of philanthropy. A benefactor does not work under legal contract for full wages and require the payment of the last penny from a Corporation overburdened with debt, which has to raise the money required by the triple process, as its accounts show, of begging, borrowing, and rating. That is the course of a man of business, and such Drake undoubtedly was. But though paid and overpaid for

* It may be mentioned here, since the strange suggestion has been made that Drake bought Buckland Abbey to expedite the work, that not a single inch of land belonging to him was touched by the leat. It does, however, singularly happen that he appears in the award as the tenant of certain land near Plymouth, the property of Edmond Parker, and, as such, entitled to compensation to the extent of 17s.

all the work he did for the town, I do not think so poorly of a man of his wealth and standing, as to assume that he would have troubled himself with this undertaking for the sake of the saving to be effected out of his £300. The clue to his actions is not, however, far to seek.

I have already pointed out that the proviso introduced into the Water Act by the committee, of which Drake was a member, is the only portion of that statute in which any mention is made of mills. I have shown also that at that time he was the lessee of the ancient manor mills of Plymouth. My quotation from the Black Book has proved that immediately the water was brought in he set to work to build mills on the leat, and with such expedition that four out of the six erected were at work within less than five months after they were commenced. And this is really the key to the whole position.

It is somewhat difficult to understand at the present day the importance attached to the possession of water mills in the time of Elizabeth, and indeed much later. They were among the most valuable properties in any way connected with land, and were to a great extent manorial monopolies, nor was their possession and working in any way derogatory, as we have seen, to the position of a gentleman. The Plymouth mills had been rented, as already stated, by the Hawkinses before they were taken by Drake, and William and John Hawkins used even to fetch the corn from the houses of the inhabitants when required. At the time the leat was made no man knew better than Drake the value of milling as a business in the locality; and it is very evident from what followed that he knew also how it might be extended. But his object was not to be obtained by straightforward ways. The Act belonged to the Corporation, and though he obtained the insertion therein of the proviso for compensating the millers on and near the Meavy, it was only by agreement with the Corporation that the right to erect mills on the leat could be obtained.* We find, in short, that from the beginning to the end of the whole business, except between Drake himself and the Corporation, his name never appears. He uses them as his stalking-horse to carry out his purposes, and takes the contract to make the leat in

* It has been suggested here of late that these mills might have included tin mills—stamping or knocking mills, sometimes called “Classe” mills. The tanners however were not concerned in the business; and the mills in question were all corn mills. In fact, the tin mills were not in use when the water scheme originated, in this district.

order to fill his own pockets. The Act is granted to the Mayor and Commonalty; the deed of compensation asserts in so many words that the construction of the leat is the work of the Mayor and Commonalty; we shall see ere long that the erection of the mills is ascribed to them also. The "composition" between the Corporation and Drake was a matter purely with themselves; and it is not until 1601, when Drake had been dead five years, that, so far as we know, his connection with the undertaking was publicly avowed. In that year a letter was written by Thomas Payne, Mayor of Plymouth, on behalf of the Corporation, to Sir Robert Cecil (Lord High Steward of the Town), asking his aid against the intrusion on their rights of one William Crymes, in which it is said:

We procured from her Maty by Acte of Parliament in the 27th yeere of her happie raigne, some parte of the River Mevy, to be brought to our towne, which cost us and Sir Frauncis Drake, who upon composicion with us undertook the bringinge home of the same, a greate some of money.* We have compounded and purchased of the owners the land over which the same runneth.

We have already seen in detail what was the "great sum" which the construction of the leat cost the Corporation. But the total amount which had been expended by them, at the time when this letter was written, including the outlay on pipes and conduits, was £850, or between £4500 and £5000 in present money, and very nearly equal to three years' ordinary revenue in the reign of Elizabeth.

The same means do not exist for estimating the outlay of Drake; but as he was paid for what he did upon the leat, his own money could only have been laid out upon the mills; while it is plain from what has been already set forth that there was a surplus of the £300 paid him under his contract to apply in that direction. We have data concerning the cost of the mills in the fact that a pair had to be rebuilt in 1672, at an expenditure of £140 18s. 6d. As wages, &c., had advanced considerably between 1591 and 1672, £400 will be an outside estimate of the outlay by Drake on buildings that required renewal in eighty years. There is no doubt that a considerable portion of the mill cost came out of his pocket, but this formed his sole expenditure on the undertaking. So far however was he from making the town any gift, that his consideration for the erection of the mills was a lease of the

* I have seen a Plymouth document of a few years later date, in which an expenditure of £18 10s. is called a "great charge!"

whole six, together with the ancient manor mills at Millbay, for a term of 67 years. And whereas the rent originally paid by him for the manor mills was £40 a year, on the completion of the leat mills the total rent of the whole was reduced to £30; with £4 4s. 4d. for two closes of land on which the leat mills in the town were built, the Corporation having themselves to pay £2 3s. 4d. as rent for a part of a close belonging to George Baron, on which the middle mill was erected.

The yearly profits of the leat mills exceeded £200, or in modern value at least £1000. Assuming therefore that the whole cost of these mills was defrayed by Sir Francis, the return must have been fifty per cent; and (again taking modern values) an original outlay of £2000 must have been recouped by a return of £67,000. Truly he and his representatives found philanthropy profitable. There is ample proof that the mills were as valuable as I have related. In 1628 the Corporation paid the then Sir Francis Drake £1500 for a moiety of the lease when it had 32 years to run, and the clear profit at that date was not £200 a year but £300.

Further evidence is supplied by a statement in a Bill which was introduced into Parliament in 1592-93 for the removal of the leat mills, under the title of "An Act for the explanacone & trewe interpretacone of a Statute made in the xxvii yere of the Quenes Ma^{ties} raigne, intituled An Acte for the preservacone of the Haven at Plymouthe." The draft of this Bill is among the records of the House of Lords, whence I obtained my copy. The preamble runs as follows:

Whereas in the Parliam^{ts} holden in the xxvijth yere of her Ma^{ties} moste gracious raigne, An Acte was made for the preservacone of the Haven at Plymouthe in the Countie of Devon in w^{ch} yt ys emongste other things enacted That y^e should be lawfull to & for the Maiore and Cominaltie of the Towne of Plymouthe, & to their Successors at all tymes after the feaste of Easter, then next comminge to digge & myne a ditche or trenche contayninge in breadthe betweene six or seven foote over in all places, through & over all the Landes & groundes lyinge betweene the said Towne of Plymouthe & anye pte of the Ryver of Mewe als Mevie and to do dyvers other thinge menconed in the said Acte, necessarie for the bringinge & contynewinge of the said Ryver of Mewe als Mevie to the said Towne as by the said Acte more at Large appeareth. Which Act was meante and intended to be for the good of the said Towne of Plymouthe by providinge of freshe water for releiffe of the said Towne, and of suche Shippes as should com into the said Porte or Haven & not for anye other entent or

purpose Neither was yt the intente of the said Acte that by meanes thereof the Quenes Ma^{tie} or such other as hadd anie Milles vppon or neare the said Ryver or Towne shoulde thereby receave Losse damage or preuidice, As by the preamble bodie & certayne provisoes in the said Acte compared & considered together dothe and maye well appeare Sithens the makinge of w^{ch} Acte the Maiore and Comynaltie of the said Towne of Plymouthe have brought a sufficient quantitie of water & parte of the said Ryver to the said Towne, Whereby they might have held them selves well contentyd & satisfied, according to the intente and meaninge of the said Acte Havinge payd litle or nothinge to the owners of the soyle through w^{ch} the said water is conducted ; But they not therewth contentyd, but covertlie & secretlie vnder coulor of a comon profytte to manie, principallie seekinge there owne private gayne and comoditie, to the greate hurte preuidice & disinheritance of other men Have wth dyvers others buylte & erected vppon the said water so broughte vnto the said Towne, Seven Corne water Mylles, By meanes whereof not onlie the Quenes Ma^{tie} havinge in Reversione two Water Milles for Corne, called the Priorie Milles of Plympton, standinge neare vnto the said Ryver But also dyvers others of her Highnes lovinge subjects through whose Lande the same newe Water course ys carried & conveyed Havinge likewise Water Mylles for Corne formerlie buylte vppon or neare the said Ryver or neare the said Towne (that ys to saye) w^{thin} one two or three myles, either of the said Towne or Ryver, sustayne & suffer & are daylie more & more like to sustayne & suffer losse and damage and disinheritance in the profite of theire Milles & otherwise to the valewe or some of Sixe thowsande Pownde by reasone of the said newe erectione & buyldinge of the new Water Mylles aforesaid contrarie to the trewe entent & meaninge of the said Statute.*

The relief prayed for and sought to be enacted was the removal of the mills as aforesaid by the Sheriff of the county within two years from the passing of the Act.

Excepte the said Maiore and Cominaltie ; Or the erectors buylders inheritors or possessors of the said newe Milles already erected and such as shall entende to erect & buylde anie other such Milles doo w^{thin} the said tyme of two yeres nexte after the ende of this Session of Parliam^{te} sufficientlie satisfie & paye vnto the Quenes Ma^{tie} and to the owners possessors & inheritors of all & everie the said Milles formerlie buylte & nowe standing vppon or neere to the said Ryver or neare the said Towne, (that is to saye) w^{thin} one two or three myles either of the said Ryver or Mewe als Mewie or of the said Towne of Plymouthe So hyndered dampnified

* It will be seen that the promoters of this Act were only interested in corn mills and those already existing ; and that the curious suggestion that the Tinnars were concerned is wholly negatived, both expressly and by implication.

or preiudiced by the said newe erected Milles, Or to be preiudiced or dampnified by anie to be erected or buylte as aforesaid Such recompense some and somes of money As the Lo : Cheife Iustice of England, the Lo : Cheife Iustice of the Common pleas at Westm. the Lo : Chiefe Baron of the Exchequer, & the Iudges of Assize of the said Countie of Devon for the tyme beinge, or anie three of them shall asseesse sett down or order vpon sollicitinge or complaynte made vnto them by the said owners possessors & inheritors of the said Milles so form'lie buylte & standing vpon or neare the said Ryver or Towne as aforesaid or anie of them.

There are two or three points to be considered concerning the Bill itself, before we proceed to comment upon its disgraceful history. It will be observed that it accepts by implication the deed of compensation as a genuine document, first by its complaint that little or nothing had been paid to the owners of the soil (and it has been shown that it was not until years after this that the Corporation, in Drake's default, paid some of these amounts); and then by providing that the compensation for the mills should be assessed by precisely the same authority, and in precisely the same way. It will be seen also that the estimate of damage done to the older mills of the district, £6000, is precisely that which is shown by the sale to the Corporation subsequently to have been the actual value of the Drake interest in the leat mills. By so much as the elder mills were injured in the withdrawal of business, by so much the new mills gained. Finally it will be borne in mind that all the promoters of the Bill asked for was that the proviso of the Water Act should be complied with, and compensation paid to the owners of the mills on or near the Meavy, if by the bringing of the water to Plymouth these mills were "impaired or hindered."

The history of the Bill is simply this: Sir Simonds d'Ewes' *Journal* records, under date March 26th, 1594:

The Bill for the bringing of fresh water to the town of Stonehouse was, upon the second reading, committed unto Sir Francis Drake, Mr. Edgecombe, Sir Thomas Conisby, Mr. Dalton, and others, who were appointed to meet to-morrow at two of the clock in the Afternoon in the Exchequer Chamber.

The Bill for the Haven of Plymouth, and the Bill for the Inning of Plimpton Marsh, were each of them read the second time, and committed to the former Committees in the Bill for the Town of Stonehouse, to meet at the same time and place, and the Bills were both of them delivered to Sir Francis Drake, one of the said Committees.*

* D'EWE'S *Journal*, p. 510.

And then we read, under date March 29th, 1593:

Mr. Broughton, Mr. Attorney of the Dutchy, Sir Thomas Dennis, and Sir Francis Gudolphen, were added to the former Committees on the Bill for the Haven of Plymouth (who had been appointed on Monday, the 26th day of this instant March foregoing, and appointed to meet at two of the Clock in the Afternoon of this present day.*

Lastly, the endorsement on the draft itself runs:

92 for the preservacon of [*Towching* erased] the haven of Plymouth | Martis xx^o Martij 92. The first reading | Lune xxvj^o Martij 93. The secunde reading and comytted.

I am free to confess that I was at first very loth to accept what seemed the natural inference from the statements of D'Ewes; and that it was not until I had the draft itself before me I felt forced to the conclusion that the character of one of our greatest seamen was sullied by one of the most shameless of jobs, and that he had prostituted his position and influence as a member of Parliament to his own private interests. Not only did he sit as chairman of a committee on a bill which alleged that the Corporation of Plymouth had wrested a public work to their private profit, whereas the deeds complained of were his and not theirs; not only did he withhold the compensation that was rightly their due from the millowners, whose custom he had abstracted; but when they appealed for justice to the High Court of Parliament, he abused his station to prevent their obtaining their legal rights by securing—as his advocates admit†—the rejection of this Bill. Then, having thus audaciously created a property at the expense of the rightful owners, he procured from the Corporation of Plymouth—powerless to resist his will—a lease of it to his sole advantage for sixty-seven years; for it is one of the worst features of the whole business that his mill lease was not granted until this Bill had been got out of the way.

Drake was a great sailor, a man of dauntless bravery, a hero to whom England as a nation is under the deepest obligations; but his own interest was present to him throughout the whole of his marvellous career, and this is by no means the only instance in which his ideas of self-help are shown to have been free from the trammels of con-

* D'EWE'S *Journal*, p. 512.

† *Vide* Rev. J. ERSKINE RISK, *Trans. Plym. Inst.* viii. 377.

scientious scruples. The history of the Plymouth Waterworks may assist us to understand what Frobisher meant in writing when Drake had turned aside from the Armada chase to seize the *Capitana* and her booty, after Hawkins and Frobisher had disabled her from doing further mischief. "He thinketh to cozen us out of our share of the 15,000 ducats, but we will have our share, or I will make him spend the best blood in his belly, for he hath done enough of those cozening tricks." More harm has been done to the character of Drake by those who have endeavoured contrary to all evidence to make him out a philanthropist and a paladin—a very Bayard of the seas—than by those who have seen that in him great virtues were allied with great faults, that while the head of the image undoubtedly was gold, the feet as certainly were but clay.

Space will not allow us to trace in anything like detail the history of the Plymouth Leat in the years immediately following Drake's death. The evil that he had done lived after him. The Corporation were held responsible for all his deeds, and Thomas Drake, his brother, proved capable only of asserting himself against the Plymothians. The country squires, who had seen with envy the way in which Drake had turned the leat to his own private advantage, now tried their hand at the same game, led on by William Crymes, of Buckland. He proceeded to divert the stream, with the assistance of three of his friends among the county magistrates—Sir John Gilbert, Tristram Gorges, and Henry Coplestone, who assessed the damage to the Corporation at 1s. a year, while divers tanners and others were encouraged to help themselves in a similar way. All this was complicated by the fact that Thomas Drake* also was the cause of some trouble, as the following entries amply prove:

1598-9 Itm pd for carryenge a lre to Mr. Maynerde
of Tauistocke and for his paines in cominge hither
aboute S^r Fra Drakes last will and Testamt† . viij^s

[A copy of the will cost 17s. 4d.]

1599-1600 Itm pd M^r Seriuent Hele for his Counsell
at the first time aboute the Leate xx^s

Itm pd for carrynge a lre to M^r Thomas Drake xij^d
[Another was sent later on.]

* He, like his brother, was a member of the Corporation, and therefore quite behind the scenes.

† Sir Francis left £40 to the poor of Plymouth.

- Itm pd Thomas Reanalson for charges in rydinge to
 Sharboure [Sherborne] to speak wth S^r walter
 Rawleigh aboute the water Course . . . xxvij^s iiij^d
 Itm pd M^r Boyes for lawes causes for the Towne as by
 his byll appeareth, touchinge the leate . . . xj^{li} ix^s vj^d
 1600-1 Itm pd for half a hogshead of Clarett wyne
 given to M^r Moore of Tauistocke for his kindnes
 and paines touching o^r water Course . . . xl^s

[Other money was disbursed by Luxton, the town clerk,
 about "following the water."]

- 1602-3 Itm paid for M^r Drakes Comission as by the
 pticulers appeareth . . . v^s viij^d
 Itm paid for a dynn^r for M^r Draks Comissioners when
 they were here about the water Course . . . xl^s
 Itm paid m^r Towne Clarke for writinge out a copie of
 M^r Drakes lease of the milles and for his mans
 horsehire for two daies . . . xiiij^s
 Itm paid him for writinge a Copie of the deed of
 p^rchase of the water Course in pchment beinge
 two skynes of pchment . . . xvijij^s
 1603-4 Itm received of Collectors towards the new
 timberinge of new bridge . . . iij^{li} vj^s viij^d

[This was somewhere connected with the leat.]

- Itm paid to John Woolcombe towards the a-mendinge
 of new bridge which the leate brake downe [margi-
 nal note: This M^r Drake must paye] . . . iij^{li} vj^s viij^d
 Itm paid for a dynner for S^r John Hele m^r Crymes
 and m^r Drake when they were here abowte the
 water Course . . . v^{li}

The controversy with Crymes was a very serious business.
 The Star Chamber was appealed to by the Corporation, while
 Crymes on his part went to the Privy Council, and addressed
 in evidence statements which the Corporation rightly com-
 plained "exhibityed manie untruthes."* However, in the event

* Some of the witnesses speak of being upon Roborough Down, near the
 Head Weir, and this has been amusingly imagined to indicate the existence
 of *two Head Weirs* (we have all heard of the two skulls of Oliver Crom-
 well), one on the Meavy and one on the Down. The simple fact is, that in
 those days Roborough Down extended over all the now enclosed lands that
 lie between the present Down and the open common beyond Douland, at
 Peek Hill—itself also far more extensive than it continues. The deed of
 compensation clearly shows that the leat traversed a portion of Roborough
 Down some distance before it reached Yannadon. Of course no one who has
 even an elementary acquaintance with waterworks would imagine that there
 could ever have been a Head Weir upon or near the Down as at present
 limited. But the old Down did reach so closely to the intake of the leat
 that the evidence of Crymes's followers in *this* particular was perfectly
 correct.

the Corporation established their rights, and together with Thomas Drake, whose concurrence under the Drake lease was absolutely necessary, agreed with Crymes that for a term of forty-two years he might

Haue take conduct convey and Carry by Ditch trench or leat now already made or hereafter to be made in or vppon certen lands of the sd W^m Crimes called Roborough Downe scituat in the psh of Bucklande monacorm aforesaid or in by or vppon any pte thereof from and out of a certen leat ditch trench or Watercourse lately made for the conveyeng of the water or Ryvor of Mewe als mevy or of some pte thereof from the said Ryver of Mew als mevy vnto in & through the Towne or Borrowe of Plymoth afsd or any pte thereof and now fleteing and Running from the said water o^r Ryver of Mewe als mevy aforesaid vnto in & through the sd Towne of Plymouth in over or through the sd lands of the said William Crymes called Rowborough downe aforesaid such pte and so much of the water of the said leat & Watercourse so made & conveyed as aforesaid as is now running or that shall at any tyme hereafter runne or be conveyed in by or through the said leat ditch trench or watercourse towards the said Towne of Plymoth as shalbe fitt & sufficient for the vse workeing and Employnt of two tynne milles knocking mills or Classe milles of the said William Crymes by him newly and lately erected vpon the said lands of the said William Crymes called Rowborrough Downe aforesaid.* And also so much water out of the said leat . . . as shall be fitt sufficient & convenient for the clensing washeing makeing workeing & dressing of all such tynne tynne mettall & tynne oare as shalbe at any tyme hereafter brought to the same mill or milles tobe washed clensed made wrought or dressed. The said William Crymes . . . at all tymes leaveing a sufficient & full streame of water to Runne & come vnto in & through the said Towne of Plymouth & eu'y pte thereof for the use of the sd Towne of Plymoth and the milles there w^hout any contradiccon of the said William Crymes. . . ."

The consideration for this grant was a valuable one. Not merely the acknowledgment by Crymes of the right of the Plymouth Corporation to a sufficient supply of water at all times, not merely the "peppercorn rent" of 12d *alone* selected for quotation in last year's *Transactions*,† but the several conditions under penalty of forfeiture

That he the said William Crymes his heires executo^r administrators and assigns . . . shall and will at his & their owne pper costs

* Here again we have evidence that these tin mills could have had no rights interfered with by the Water Act. They were "newly and lately erected!"

† "Recent Revisions of the Drake Chronology," *Trans. Devon. Assoc.*, xv. 200.

& Charges during the said terme well and sufficiently reapeare amende vphold and maynetayne all such breaches and decayed places whatsoeu' w^{ch} shall at any tyme hereafter happen to break out of the said leate or water course from one hedge or fence scituat and beinge nere the house of one William Cominge on Rowborough Downe aforesaide and so downewarde the leate or water course so far as the lands and inheritance of the said W^m Crymes called Roborough Downe aforesaid doe extende. And also shall and will at all tyme & tymes dureing the Contynuanee of the said lease at his and their owne pper costs charges and expences find and pvide to and for the better assistance and helpe of the said Maior & Coialty & their successors & the said Thomas Drake & his assignes sixe sufficient and labour men to labour and worke in the tyme of Froste for the clearing and cleansinge of the said leate and watercourse in ou' and throughout all or anie the lands of gamaliell Slanninge esquier scituat in and vpon Rowborough Downe aforesaide nowe in the tenure of Margarette Heathe widowe And the saide William Crymes . . . doth further Covennte . . . to and with the said Maior and Cominalty and to and with the said Thomas Drake. . . . That it shall and maie be lawfull to and for the said Maior and Cominalty and the saide Thomas Drake . . . at all tymes hereafter to erecte and builde any bridge or bridges vpon any the lands of the said William Crymes called Rowborough Downe ou' w^{ch} any pte of the saide leate doth runne towards Plymouth aforesaide for the better and easier passage of trauele^m and carriages ou' the saide leate & to digg cutt haue take & Carry away any earthe turfes and stones vpon the said downe or other lands of the sd Crymes through w^{ch} the sd Ryver doth runne for the makinge and reedifenge and amendinge of any the said brydgs and bancs over & of the said Ryver or watercourse in vpon & throughout the said Downe . . . w^{ch} is the lands of the sd William Crymes.

If this is what is to be called a "peppercorn rent," it is easy to understand failure to comprehend the meaning of plain English in the deed of compensation, nor can it be necessary to carry the argument upon this head any longer.

It has been the misfortune of the Corporation of Plymouth that this controversy with Crymes was only the beginning of troubles, and that the crooked ways indulged in by Drake, coupled with the loss or abstraction of many of their records, have involved the authorities of that town in controversy respecting its water rights from the time of the erection of the mills until the present day.

Let me, in conclusion, briefly sum up the "traditionary" account of Sir Francis Drake, upon which alone those who contend for his "free gift," or his "gift" in any sense, of the

water supply to Plymouth can rely—by way of contrast with the plain, straightforward statement of the only competent witnesses, the contemporary official documents :

Tradition says of him (and, unsupported by evidence, one tradition is as good as another), that he "brought in" the water by art magic, compelling a Dartmoor spring to follow his horse's tail into the town ; and that as the water ran before his door he dipped his scarlet gown therein for joy, which probably accounts by imitation for the number of Corporate coat tails immersed at sundry Fishing Feasts of later date—if wicked rumour speaketh truly—after dinner. Tradition avers that he made fire ships by throwing chips of wood from the Hoe into the Sound ; that he "shot the gulf" which divided this upper world from the antipodes by a pistol, painted in one of his portraits ; that he threw a poor lad overboard lest the boy should turn out a cleverer man than himself ; that he fired a cannon ball through the earth to save his wife from committing bigamy ; that he rises to his revels when you beat his old drum at Buckland Abbey ; that he is the "wild huntsman" with the "wish hounds" of Dartmoor ; and that the only reason why Tavistock is not now a seaport is that the inhabitants would not grant Drake an estate on which he had set his heart ! Strange that with all his philanthropy he should, if hearsay be true, have tried to drive such a hard bargain with his native town. What is the value of unsupported tradition in connection with a man whose memory is wrapped in such a cloud of legendary lore as this ? Of all the Englishmen who have been reputed dealers with the devil, from Roger Bacon to Oliver Cromwell, there is not one whose memory has blossomed into such exuberant legend as Drake. This water myth is no isolated fancy, but has its place as an integral part of one inconsistent whole.

SOME RECENT REVISIONS OF PLYMOUTH HISTORY.

BY REV. J. ERSKINE RISK, M.A.

(Read at Newton Abbot, July, 1884.)

OUR long-accepted notions of the verdict of contemporary history and tradition having recently received some rude shocks, with respect to the part attributed to Sir Francis Drake as the donor of the water which he is admitted to have brought into Plymouth, I have now to pass in review two points in regard to which "this new departure" has taken place.

First. Was there a pre-existing Warleigh Mill Leat? The evidence alleged in support of this assertion consists of the gossip of the old man Giles, and also of a passage extracted from the present title-deeds of the Sheepstor Estate. I need only refer to the latter. The deed of purchase by the Northmores of Sheepstor Manor from the Elford family, about 1751, recites a provision that "Walter Radcliffe, Esq., of Warleigh (the then owner), had to pay 1d. rental for the running of the Warleigh Mill Leat into the Meavy above the Plymouth Leat Head Wear." The contention on this point of course is this: The only Plymouth Head Wear must be that at Sheepstor, where the manor is, and so the Leat must first have run from Sheepstor to Warleigh. But recent discoveries in the Record Office in regard to the Crymes' inquiry under the Star Chamber in 1602 (a source of evidence superior to mere municipal records), do not seem to confirm the view of there being only one Plymouth Head Wear. In this inquiry the examinations of Edwards and Cripps and other witnesses from Buckland Monachorum and Meavy, referring to the scene of the dispute between Thos. Drake and Crymes and his fellows, expressly state

the dispute to have occurred "on Roborough Down, on the high road near the Head Wear," and on Crymes' property. It is no sufficient reply to this to say that Roborough Down once extended as far as Sheepstor; for, if so, the face of the country must have changed in a remarkable manner, for Yannadon Down now lies between, and it can by no means be identified with Roborough Down, though Roborough *Hundred* extends as far as Lifton. Besides this, we have to identify the high road lying near Crymes' property, and we can only get our site near the tinworks on Roborough Down, which are marked on the Cecil Map, and certainly cannot be pushed on to the neighbourhood of Sheepstor. We therefore conclude, that as every leat is said to have its own head wear, there must have been a Roborough Head Wear, also called a Plymouth Head Wear, where the Warleigh Leat now runs out of the Plymouth Leat, near Roborough Mills. To this may be added the consideration that the deed of compensation accounts for every yard of the land from Sheepstor, right into Plymouth, *thereby ignoring the supposition of a pre-existing Warleigh Leat.*

The Sheepstor title-deed of 1751 also states that the Warleigh Leat ran into the Meavy *above* the Plymouth Head Wear, and it has been urged that the Meavy does not run along Roborough Down at the point of intersection. But if it does not exactly do so, it runs parallel to the Plymouth Leat at a point nearer to Meavy village; and no Leat ever ran into the Meavy above Sheepstor, though there may be traces of a channel at Longstone, which is *not* above the Head Wear. The explanation would therefore be this, so as to clear up the indications of site in the documents referred to. When Crymes succeeded in establishing his rights to a water supply for his new tin mills for forty years, at a peppercorn rent of 1s., he does not appear to have kept these tin mills* for very long; and so he probably utilised his temporary water rights in favour of the Warleigh water supply. But this would be done by turning his water supply into "the Meavy" considerably nearer to Meavy village, and then taking it out again on Roborough Down, where the Warleigh water supply issues from the Plymouth Leat, near Roborough Mill, which would be somewhere near the high-

* The Record Office Report of the Crymes' Inquiry effectually disposes of the recent denial of the legal claims of the tanners to compensation, by showing that the tanners' consent was had for the Act of 1585, and also that Thomas Drake's servants were had up before the Stannary Court for interfering with the water supply to Crymes' Mills (for tin) from the Plymouth Leat on Roborough Down.

way on Crymes' former property, near the so-called Plymouth Head Wear; i.e. one of the then existing Head Wears for Plymouth on Roborough Down. But when I speak of Crymes turning his water supply into "the Meavy," we must remember the extended meaning given to "the Meavy" in early documents. We refer to *Plym. Inst. Trans.* p. 467, 1880-81, and there we find the record: "This yere . . . Drake began to bring the ryver Mewe to the town of Plymouth." [N.B.—"Bring *the ryver Mewe*" (not Warleigh Mill Leat) "to Plymouth."] And the length of watercourse is given at twenty-five miles.

Our second point of divergence in this paper from recent revisions of Plymouth history relates to the charge of double-dealing made against Drake for the part he took in committee in relation to the Mills Removal Bill of 1592. So much has been said about this in the *Devon. Assoc. Trans.* for 1883, that little need be said in recapitulation. A good deal depends on the dates of proceedings in Parliament in relation to this second Haven Bill. But it seems now to be clearly made out that this second Haven Bill never reached a third reading, though it does seem strange that a draft of the Bill should be found in the Records of the House of Lords. The date of the opening of the eighth Parliament of Elizabeth now appears, from the Parliamentary Blue Book on Parliaments, to have been 19th February, 1592-3, a fact which negatives the possibility of any Bill having passed through a second reading on that day. The date of the second reading of the Bill is fixed in D'Ewes' *Journal* as the 26th March, 1592-3, instead of 19th February, 1592-3. And after this date (the 26th March), no further mention of any progress with the Bill occurs, with the exception of a fuller committee being appointed on 29th March, when the Bill was either summarily quashed in committee, or because the outstanding claims of the mill-owners were satisfied. Hence the conclusion is obvious, as the House of Lords Records appear to have escaped the fate, by burning, which befel the House of Commons Records. From some cause or other, the Bill of 1592 must have been quashed, probably in committee; and when we consider the relation in which Drake stood to the Corporation Mills, built by him, and rented from them, we can be at no loss to gather who it was that (it may be by paying up the millowners' claims himself) gave the Mills Removal Bill "the happy despatch" which "removed" it from the category of the disturbers of the peace of the Plymouth Corporation. It was, I hold,

Drake who did the deed ; and, as we cannot look upon him as a time-server, destructive of his own interests, it follows that to him the Corporation were indebted for the defeat of the last attack made upon them in Parliament.*

I may now refer to one or two points raised in the foregoing discussion. And, first, as regards the statement that every yard from Sheepstor into Plymouth is accounted for in the Deed of Compensation of 1592. If we trace the watercourse all the way to Plymouth we find everywhere the track of Drake's direct or indirect influence. Elford's lands at Sheepstor, at the head of the Leat, including Longstone, were in the hands of Thomas Drake, Sir Francis' brother. Thomas Drake married Elford's widow, a Miss Gregory, of Plympton, and so could control that property. Hele was related to Sergeant Hele, Drake's friend. Crymes and the Drake family intermarried; but at a later period Crymes held Roborough Down,† on which a principal head wear of the Plymouth Leat was said to be, so that the water had *not* to run up hill, as would have been the case had the Head Wear been at Sheepstor. Coplestone, no doubt, used the water for Warleigh after Crymes had done with it. It is remarkable that Sir Nicholas Slanning's daughter and heiress Grace married Sir James Modyford, whose daughter and heiress married Edward Drake, and brought him *Maristow*. He died in Jamaica, and she married secondly Peter Heywood. James Modyford Heywood sold Maristow to Sir Masseh Lopes. There were intermarriages between the Pollexfens and Drakes, some of the Drakes being called Pollexfen Drakes. The Fytes, or Fitzes, were next neighbours of Drake's family, and Drake himself was trustee for all Fitz's land. Trelawney was a family connection through Harris, whose family were more intimately bound up with the Drakes, Christopher Harris being M.P. for Plymouth to secure passing of the Scouring Plymouth Haven Act. As to Parker's land, Drake was lessee, and had everything in his own hands. Then as to the land of William Hawkins, the brother of Sir John Hawkins, there was a similar family connection with the Drakes. So much for Drake's influence all the way from

* This action of Drake's has been styled "a shameful job," on the assumption that he had himself "made chairman of committee, and quietly shelved the bill."—"Credat Judæus," &c.!! And Sir Martin Frobisher's imputation of "cozening cheats" in the matter of Don Pedro's ship in the Armada fight, is distinctly disproved by the evidence of the mariner Starke, of the *Revenge*, who says "they did not see Don Pedro overnight." (See Motley's *United Netherlands*, vol. ii. p. 525., Note.)

† *Plymouth Instit. Trans.* p. 521, 1880-1.

Sheepstor into Plymouth over the intervening estates. While as regards the valuers of the land, we have Christopher Harris, Drake's other self; Thomas Wise, a connection of Tremayne, Drake's quasi-father; William Strode, a friend (his daughter married Drake's nephew); William Crymes, neighbour of Drake at Buckland; Slanning, a friend of Drake, and Hawkins; the family of the Slannings afterwards intermarrying with the Drakes. Then we have Peperell, mayor of Plymouth, and of course co-operating with Drake. And finally as regards Rowe—also on the Compensation Roll—the Drakes married into the Rowes. So that along the whole line of the Leat, or watercourse, from Sheepstor into Plymouth the Drake influence was paramount; and as regards the family of Coplestone, which would be the one the most connected with the Warleigh Leat, if pre-existing, this is the only family the connection of which with the Drakes is not so clearly made out as that of the other families lying along the course of the Leat. Does not this show that the relations of the Coplestones and their Warleigh Leat were more recent than those of the families along the more direct course?

And now as regards the question, Had the Plymouth Leat of 1590 an outfall as a Leat at Sutton Pool?

We have important evidence on this point in the Map of the Course of the Leat now in the custody of the Orphans' Aid Charity of Plymouth. It will be remembered we are told in *Plym. Instit. Trans.* (p. 473, vol. vii. pt. iii. 1880-1), that "in 1628 the Corporation paid £1500, equal to £7500 now, for a moiety of the Drake lease as an endowment for the Hospital of Orphans' Aid, when it (the lease) had 32 years to run." We are referred to an entry in 1591-92 as to the conveyance of the water to Coxside. (*Plym. Inst. Trans.*, p. 476, 1880-1.) This, however, was only by means of "a lead pipe from the Leat into Old Town, whence or from the conduits it was allowed to flow in channels through the streets down to the water at Sutton Pool." (*Ibid.* p. 477.) But this cannot by any stretch of language be called a conveyance of the Leat as such down to Sutton Pool, and at most could only be said "to bring a stream from the Leat," and not the Leat itself into Sutton Pool. The Leat itself would have been inadequate for "the scouring process" of the Act of 1584-5: how much more the stream from the Leat!

I now proceed as briefly as possible to describe the course of the Leat through the town as seen on the Orphans' Aid

Hospital Map of 1628. The water channels on this map are all tinted yellow, and show the course of the Leat as such to have been through the Sourpool into Millbay. The flow of the Leat is marked behind what was then called Stonehouse Lane, but which is Frankfort Street and King Street now. These streets were not then in existence, and the map explains that there were then no houses outside Frankfort Gate. Frankfort Gate itself was situate near what is now known as the Globe Hotel—a fact commemorated on the slab in the wall of the hotel. The Leat crosses what is now known as York and Russell Street, goes down at back of Morley Place or Street, then across Frankfort Street by Queen Street, crosses Union Street, and goes behind what is now Farley's Hotel to Millbay. All this ground in Drake's time was marsh land; but he or his successors converted it into meadow. "The road to Pennycomequick" marked on the Orphans' Aid Map is now Russell and York Streets, which were not then built. Sourpool may be taken to be the old pool and marshland outside our tracing (of the Orphans' Aid Map), between it and Millbay, the part on which Union Street now stands. Till recent times this was called the Marshes. Lockyer Terrace, in Union Street, and what is now known as Union Terrace, stand on the site of the marsh. Thus much I have thought it necessary to say in explanation of the Leat Map of 1628, and I think it most conclusive as to the real course of the Plymouth Leat up to that time. There certainly does not seem to be much colour given by this ancient map to the assertion which has been made that 1598-9 is "the probable date of diversion of Leat outfall from Sutton Pool to Millbay." Had such been the case, the map of 1628, or thereabouts, should have given some indications of the change.*

* The entry of 1591-92 only mentions that the water was conveyed from the Leat into Old Town by means of a lead pipe, and from thence by channels from the pipe or conduits into Sutton Pool. It therefore affirms nothing about an outfall of the Plymouth Leat in 1591-2 into Sutton Pool, while the second Cecil Map, referred to in my first paper, expressly states that "the river was brought into Plimmouth Milpoole by Sir Francis Drake . . . and six milles builded by him, and this poole made drie for a meadow." From all which it appears that "the river," or Leat, was thenceforward to furnish the driving power of the mills there.

LORD TREASURER CLIFFORD.

BY EDWARD WINDEATT.

(Read at Newton Abbot, July, 1881.)

WHEN, in 1660, the Corporation and Freemen of the ancient borough of Totnes returned Thomas Clifford, Esq., of Ugbrooke, Chudleigh, as one of their representatives to the Parliament or Convention which recalled Charles II. to his father's throne, they little thought perhaps that the quiet country gentleman they selected would take so prominent a place in the history of our country; and it is possible that some of them may have compared him unfavourably with the two men who represented them in the Long Parliament—Oliver St. John, the Solicitor-General, and Serjeant Maynard.

It does not appear what special interest Thomas Clifford had which caused his election for Totnes, and again his re-election in 1661. The prominent part he played in English history, and his connection with our county and this immediate neighbourhood, are sufficient reasons why a brief sketch of this remarkable man should find a place among our *Transactions*.

Thomas Clifford, who was born at Ugbrooke, 1st August, 1630, was the son of Hugh Clifford and his wife Mary, eldest daughter of Sir George Chudleigh of Ashton, Bart. He was grandson of Dr. Thomas Clifford, Prebend of Exeter Cathedral; and it was after his grandfather he received the name of Thomas.

Ugbrooke appears to have become the property of Thomas Clifford, the grandfather, on the death of Lady Elizabeth Courtne, of Ugbrooke, who died in March, 1605.

The future Lord Treasurer, on 25th May, 1647, was admitted a Commoner of Exeter College, and had for his tutor there Baldwin Acland, B.D., Treasurer of Exeter Cathedral, who subsequently married his only sister, Mary Clifford.

Leaving the University, Thomas Clifford entered the Middle Temple, and subsequently improved himself by travel abroad.

It was early in April, 1660, he was elected, in conjunction with Thomas Chafe, Esq., as M.P. for Totnes; and in the ensuing year, when a new Parliament was summoned, he was re-elected, Sir Edward Seymour, of Berry Castle, afterwards Speaker of the House of Commons, being then his colleague.

At first he was a decided oppositionist, and it may be to that fact he owed his election, as the borough of Totnes contained a very strong Puritan party; but after a while he gradually became a strenuous supporter of the Court, and he thus attracted the notice of the king, and had conferred on him the honour of knighthood.

It is, however, said that this honour he received in consequence of the personal and prominent part he took in the Dutch war and as a diplomatist, in which he showed his abilities at the courts of Sweden and Denmark, where he arranged and carried to a successful issue treaties of alliance, which required no little ingenuity to settle in a manner satisfactory to all persons concerned.

Lord Arlington, writing to him 20th August, 1665, congratulating him on his success at Bergen, says: "I have always told you you are reserved for some good fortune; in the meantime be content that his Majesty and all your friends have an entire satisfaction in your good conduct and behaviour."

This diplomatic work occurred between the two Dutch fights, the first of which took place 3rd June, 1665, and the second 25th July, 1666.

Between these two fights and his other work Clifford did not forget to attend to local business, as appears from an entry in the "Acts of the Chamber of Exeter," 3rd April, 1666: "It is this day agreed that a piece of plate of £10 be bought and presented to Sir Thomas Clifford from this house for his great regard to the present affairs of this city." Again, on 27th June, 1671: "Three, or at least two, of this Chamber to ride to Sir Thomas Clifford, now at his house at Chudleigh, and to present the service of the city to him, with their thankful acknowledgments of his favour to them in the case of Browning, and to present him with a piece of plate to the value of £20 or £25."

Browning had erected fulling mills to the injury of the Chamber's property on the river Exe. Gossipping Mr. Pepys, in his *Diary*, September 17th, 1666, mentions Sir Thomas

Clifford, "who appears a very fine gentleman, and much set by at Court for his activity in going to sea and stoutness everywhere and stirring up and down."

In November, 1666, on the death of Sir Hugh Pollard, Comptroller of the Household at Whitehall, Clifford obtained the White Staff; and John Evelyn, in his *Diary*, refers to Sir Thomas as "a bold young Gentleman of a small fortune in Devon, but advanced by Lord Arlington, Secretary of State, to ye great astonishment of all the Court."

Again, under date 26th April, 1667, Pepys records:

"At Whitehall talked with Mr. Evelyn. By and by we discoursed of Sir Thomas Clifford, whom I took for a very rich and learned man, and of the great family of that name. He tells me he is only a man of about 7 score pounds a year, of little learning more than the Law of a Justice of the Peace, which he knows well; a parson's son got to be a burgess in a little borough in the West, and he fell into the acquaintance of my Lord Arlington, whose creature he is, and never from him; a man of virtue and comely and good parts enough, and has come into his place with a great grace, though with a great skip over the heads of a great many."

Mr. Pepys was of course in error in calling him a parson's son; it was his grandfather who was in holy orders; his father was a private country gentleman, and is said to have been a colonel in the king's army during the Scotch rebellion, 1639, and died the same year, on his return from the northern march.

And again, Pepys records, under date September 9th, 1668:

"To Whitehall, where Brouncker, W. Pen, and I, attended the Commissioners of the Treasury about the victualling contract; where high words between Sir Thomas Clifford and us, and myself more particularly, who told him that something that he said was told him about this business was a flat untruth. However we went on to our business in the examination of the draught, and so parted, and I vexed at what happened."

"Nov. 5th, 1668.—At the Treasurer's, Sir Thomas Clifford, where I did eat some oysters; which while we were at, in comes my Lord Keeper and much company; and so thought it best to withdraw."

"19th March, 1669.—Sir Thomas Clifford did speak to me, as desirous that I would sometime come and confer with him about the Navy, which I am glad of, but will take the direction of the Duke of York before I do it, though I would be glad to do something to secure myself, if I could, in my employment."

"29th March, 1669.—I to Sir T. Clifford, and there, after an hour's waiting, he being alone in his closet, I did speak with him,

and gave him the account he gave me to draw up, and he did like it very well, and then fell to talking of the business of the Navy ; and giving me good words, did fall foul of the Constitution, and did then discover his thoughts. I did not give much encouragement to that of finding fault with my fellow officers, but did stand up for the Constitution. He did give me of myself very good words, which pleased me well, though I shall not build upon them anything."

"*April 8th, 1669.*—Up and to Whitehall to the king's side to find Sir T. Clifford, where the Duke of York came and found me; which I was sorry for, for fear he should think I was making friends with that side. But did put it off the best I could my being there ; and so by and by had opportunity alone to show Sir T. Clifford the fair account I had drawn up of the customes, which he liked, and seemed mightily pleased with me."

So much was Clifford in favour at Court, that within a month of receiving the White Staff he was named by the king a Privy Counsellor.

On 13th June, 1668, the king appointed him Treasurer to the Household ; and on the 8th of the following month declared him a Lord Commissioner of the Treasury.

During Lord Arlington's absence in Holland, Sir Thomas was directed to execute the duties of his office as principal Secretary of State.

In 1671 he met with a severe loss, his son Thomas, baptized at Chudleigh 18th December, 1652, dying at Florence 29th March, 1671 ; his corpse was brought home in an English frigate, and deposited in Ugbrooke Chapel 28th July that year.

At this time he must have had an inclination towards the Church of Rome, as appears from an entry by John Evelyn in his *Diary*.

"1671, *May 17th.*—Dined at Mr. Treasurer's (Sir T. Clifford) with the Earl of Arlington, Carlingford, Lord Arundel of Wardour, Lord Almoner to the Queene, a French count and two abbots, and several more of French Nobility ; and now by something I had lately observed of Mr. Treasurer's conversation on the occasion, I suspected him a little warping to Rome."

The leading men of the Cabinet were Clifford, Ashley, Buckingham, Arlington, and Lauderdale, and were known by the appellation of the Cabal, a word which the initial letters of their names happened to compose.

Lord Macaulay says Clifford was the most respectable of the party ; for with a fiery and imperious temper he held a

strong sense of duty and honour, and was the only one of the five who had any claim to be regarded as an honest man.

On 22nd April, 1672, the king raised him to the peerage by the style and title of Baron Chudleigh; but Parliament having been prorogued on 14th April to 30th October, 1672, he had to wait until the latter date to take his seat in the Upper House, when he was introduced by Lord Arundell of Wardour, and Lord Newport. Through the influence of the Duke of York, the king's brother, he was advanced to the most profitable office in the kingdom; viz., that of Lord Treasurer, the king "thinking nobody fitter for it;" and King James II. asserted on one occasion "that he never knew but one of his brother's ministers that served him throughout faithfully and without reproach but Lord Clifford."

At the same time it is asserted on the other side that he obtained the office of Lord Treasurer by advising the king to shut up the Exchequer, and to seize what was in it; and John Evelyn thus in his Diary refers to this important business:

"1672, *March 12th*.—A few days before this the Treasurer of the Household, Sir Tho. Clifford, hinted to me as a confident that his Majesty would shut up the Exchequer (and accordingly his Majesty made use of infinite Treasure there to prepare for an intended rupture); but, says he, it will soon be open again, and everybody satisfied; for this bold man also had been the sole adviser of the king to invade that sacred stock (tho' some pretend it was Lord Ashley's counsel, the Chancellor of the Exchequer), was so over confident of the success of this unworthy designe against the Smyrna Merchants as to put H.M. on an action which not onely lost the hearts of his subjects and ruined many Widows and Orphans, whose Stock were lent him, but the reputation of his Exchequer for ever, it being before in such credit that he might have commanded halfe the wealth of the nation."

This measure appears the one great blot in Clifford's character; at the same time it is stated, in the life of James II., compiled from the Stuart manuscripts, and published in 1816, that it was Shaftesbury, and not Clifford, who advised it. There is also a curious vindication of this very measure in the *Gentleman's Magazine*, 1732.

Bishop Burnet imagined that Clifford became a Roman Catholic during Charles II.'s exile; but this could hardly be so; for 13th September, 1667, he signed a letter of the Privy Council, dated from Whitehall, addressed to the Justices of the Peace for Devon, urging them to put the laws against Papists in force; nor could he have been a

Catholic when he applied to Dr. Anthony Sparrow, Bishop of Exeter, to consecrate a cemetery at Ugbrooke, and to dedicate and consecrate the adjoining chapel dedicated to St. Cyprian, which the Bishop did on 17th July, 1671; at the same time it would appear, from Evelyn's note, under date May 17th, 1671, that he had at that time leanings towards Rome.

It appears probable that Rev. Hugh (Serenus) Cressy, o.s.b., was the means of reconciling him to the Church of Rome, a correspondence having taken place between them.

In 1673 his change of views must have been well known; for Lord Shaftesbury managed to get the Test Act passed 29th March of that year, with a view to overcome the influence of the Duke of York and the Lord Treasurer, and exclude them from the Cabinet, yet a special clause was inserted exempting the Royal Duke.

Unable to accept the test, Clifford resigned all his appointments, June, 1673. As James II. said, "This new test had the effect of ousting Lord Clifford of the place of Lord Treasurer of England, and of being any longer a Privy Councillor, who, though a new convert, generously preferred his conscience to his interest."

On retiring from public life Lord Clifford went to Tunbridge Wells for the benefit of his health, and was there visited by John Evelyn, who thus records his visit:

"July 25th, 1673.—I went to Tunbridge Wells to visite my Lord Clifford, late Lord Treasurer, who was there to divert his mind more than his body. It was believed that he had so engaged himself with the Duke that rather than take the test, without which he was not capable of holding office, he would resign that great and honourable station. This I am confident grieved him to the heart, and at last broke it; for tho' he carried with him musick and people to divert him, and when I came to see him lodged me in his own appartment, and would not let me go from him, I found he was struggling in his mind, and being of a rough and ambitious nature he could no way brook the necessitie he had brought on himself of submission to this conjecture. Besides, he saw the Dutch warr, which was made much by his advice, as well as the shutting up of the Exchequer very unprosperous. Burnet says the Earl of Shaftesbury was the chief man in this advice. There is a story, though I do not recollect the author, that Shaftesbury formed the plan, that Clifford got at it over a bottle of wine, and carried it to the King as his own. These things his high spirit would not support. Having staid here two or three daies I obtained leave of my Lord to return."

After a short stay at Tunbridge, Clifford returned to town, and Evelyn again visited him, and thus records this his last interview with him :

“Aug. 18th, 1673.—My Lord Clifford, being about this time returned from Tunbridge and preparing for Devonshire, I went to take my leave of him at Wallingford House. He was packing up pictures, most of which were of hunting wild beasts, and vast pieces of bull baiting, beare baiting, &c. I found him in his study and restored to him several papers of state and others of importance, which he had furnished me with, on engaging me to write the *Historie of the Holland War*, with other private letters of his acknowledgments to my Lord Arlington, who from a private gentleman of a very noble family, but inconsiderable fortune, had advanced him from almost nothing. *The first thing was his being in Parliament*, then knighted, then made one of the Commissioners of the sick and wounded. On which occasion we sate long together. Then on the death of Hugh Pollard he was made Comptroller of the Household and Privy Counselor, yet still my brother Commiss^r. After the death of Lord Fitz-Harding, Treasurer of the Household, he by letters to Lord Arlington, which that Lord shew'd me, begg'd of his Lordship to obtain it for him as the very height of his ambition. These were written with such submissions and professions of his patronage as I had never seen any more acknowledging.

“The Earl of Southampton then dying, he was made one of the Commissioners of the Treasury.

“His Majestie inclining to put into one hand, my Lord Clifford made pretence of making all his interest for his patron, my Lord Arlington, cutt the grasse under his feet, and procur'd it for himself, assuring the king that Lord Arlington did not desire it.

“Indeed, my Lord Arlington protested to me that his confidence in Lord Clifford made him so remisse and his affection to him was so particular, that he was absolutely minded to devolve it on Lord Clifford, all the world knowing how he himself affected ease and quiet now growing into years, yet little thinking of this go-by.

“This was the onely greate ingratitude Lord Clifford shew'd, keeping my Lord Arlington in ignorance, continually assuring him he was pursuing his interest, which was the Duke's, into whose great favour Lord Clifford was now gotten, but which certainly cost him the losse of all ; namely, his going so irrevocably far in his interest. For the rest, my Lord Clifford was a valiant, incorrupt Gentleman, ambitious, not covetous, generous, passionate, a most constant sincere friend, to me in particular was. When he layd down his office I was at the end of all my hopes and endeavours ; these were not for high matters, but to obtain what his Majestie was really indebted to my Father-in-Law, which was the utmost of my ambition, and which I undoubtedly had obtained if this friend had stood. Sir Tho. Osborn, who succeeded him, tho'

much more obliged to my Father-in-Law and his Family, and my long and old acquaintance being of a more haughty and far lesse obliging nature, I could hope for little ; a man of excellent, natural parts, but nothing of generous or grateful.

"Taking leave of my Lord Clifford, he wrung me by the hand, and looking earnestly on me bid me 'God-bye,' adding, 'Mr. E., I shall never see thee more.' 'No,' said I. 'My Lord, what's the meaning of this? I hope I shall see you often, and as great a person again.' 'No, Mr. E. do not expect it ; I will never see this place, this Citty or Court againe,' or words of this sound. In this manner, not without almost mutual tears, I parted from him ; nor was it long after ; but the news was that he was dead, and I have heard from some who I believe knew, he made himself away after an extraordinary melancholy.

"This is not confidently affirmed, but a servant who lived in the house, and afterwards with Sir Robert Clayton, Lord Mayor, did as well as others report it ; and when I hinted some such thing to Mr. Prideaux, one of his Trustees, he was was not willing to enter into that discourse.

"It was reported with these particulars that causing his servant to leave him unusually one morning, locking himselfe in, he strangled himself with his cravats upon the bed tester ; his servant, not liking the manner of dismissing him, and looking through the keyhole (as I remember), and seeing his master hanging, broke in before he was quite dead, and taking him downe, vomiting a greate deale of blood, he was heard to utter these words, 'Well, let men say what they will, there is a God, a just God, above,' after which he spoke no more. This, if true, is dismal."

Evelyn recalls a statement of Lord Shaftesbury, made to all the brethren of the Council of Foreign Plantations at Whitehall, to this effect :

"That being one day discoursing with him when he was only Sir Thomas Clifford speaking of men's advancement to great charges in the nation, 'Well,' says he, 'my lord, I shall be one of the greatest men in England. Don't impute what I say either to fancy or vanity ; I am certain that I shall be a mighty man, but it will not last long ; I shall not hold it, but dye a bloody death.' 'What,' says my lord, 'your horoscope tells you so ?' 'No matter for that, it will be as I tell you.'"

Evelyn also records that Sir Edward Walker (Garter King at Arms) had told him a long time before, when Clifford was just made a peer—

"That carrying his pedigree to Lord Clifford, on his being created a Peer, and finding him busy, he bid him go to his study and divert himself there till he was at leisure to discourse with him about some things relating to his family. There lay, said Sir

Edward, on his table, his horoscope and nativity calculated, with some writing under it, when he read that he should be advanced to the highest degree in the State that could be conferred upon him, but that he should not long enjoy it, but should die or expression to that sense; and I think (but cannot confidently say), a bloody death. This, Sir Edward affirmed, both to me and Sir Richard Browne; nor could I forbear to note this extraordinary presage in these memoirs." *

Lord Clifford must have reached Ugbrooke towards the end of August, 1673; and Prince and Calamy affirm that his disease, the stone, grew upon him with such violence as soon after to terminate his life. He died 17th October, 1673, and his will, which was dated 7th October, was proved 25th November of that year.

In his will he directed that his funeral should be conducted without any unnecessary cost or ceremony, strictly forbidding all scutcheons or other mourning to be hung up for him in any place whatsoever; and, if possible, that he might be buried in the silent time of the night.

He was buried in the vault of the chapel at Ugbrooke; the following inscription being placed over his remains:

Hic jacet THOMAS DOMINUS
CLIFFORD Baro de Chudleigh
Spe Resurrectionis
Natus erat primo Augusti
1630 et obiit 17 Octobris
1673
Apud Ugbrooke.

The rumour referred to by Evelyn as to the manner of Lord Clifford's death, appears to be a rumour, and nothing more. John Prince, in his sketch of the Lord Treasurer in his *Worthies of Devon*, makes no reference to anything of the kind, though he was a contemporary and neighbour, being minister of St. Martin's Church, Exeter, at the time of

* Lord Clifford has kindly shown me a horoscope preserved at Ugbrooke, evidently the one above referred to, being the "Nativitie" of a person of noble birth, born 1st August, 1630. On referring to it, I found that it predicted he should be advanced to great position. The entry as to death is as follows:

IMPRISONMENT AND DEATH.

"Here are divers arguments of restraint or imprisonment to befall ye Nativitie, and some also of a violent death; and this by the malice and treachery of pretended female friends, which is my opinion he ought always to be watchful or jealous of and trust no further unto them."

The years 1673-4 (he died 1673) are years of caution, but the horoscope goes on to 1677.

Clifford's death; and two years later was appointed vicar of Totnes, and thence preferred to Berry, where he wrote the *Worthies*. Prince refers to the actual disease which caused his death.

Lord Clifford's will too, made only ten days before his death, 7th October, 1673, refers to his being "of perfect memory and sound mind, though weak in body," and gives very full and explicit directions as to his funeral.

The absence of tradition in the neighbourhood and the silence of his political enemies, would also go to prove the statement as incorrect. Sir Henry Capel, on seconding Lord Russell's motion, 26th October, 1680, for excluding the Duke of York, thus refers to Clifford, "We can never too much detest Lord Clifford," and then observes, "he broke his heart, as is by most believed, to see himself so disappointed in his great design of refixing Popery here," not alluding in any way to suicide.

It should not be forgotten that Lord Clifford was still in favour with the king, and was not therefore likely to be overwhelmed with chagrin and disappointment, especially as his resignation was his own act, in refusing the test which he might have accepted had his only desire been power and office. As a proof that he was still in favour with the king, it may be mentioned that he retired from office 19th June, 1673, and on 19th of the following month Charles I., to prevent the possibility of any impeachment by his enemies, issued to him letters patent of special and general pardon of all offences committed against the Crown prior to the 30th of June of that year. On the same day the king gave him his royal license to impark 240 acres round Ugbrooke; and 30th July gave him the perpetuity of the pension of £145 per annum payable to the Crown by the Dean and Chapter of Exeter—reserved by Queen Elizabeth's deed, of 5th July, 1585, in consideration of her regrant to that body of those rentals and estates which had formerly maintained the chantry services in Exeter Cathedral.

The Clerkship of the Pipe Office was also enjoyed by Hugh Clifford, the Lord Treasurer's eldest son; and his next son, Simon, had a Teller's place in the Exchequer.

Prior to this, 15th July, 1672, the king granted him Cannington Priory, with its manor and rectory; also the Manor of Fitzpain and the Hundred of Cannington, with the Free Chapel of Piddlewaldeston; and on 14th April, 1673, he confirmed to him and his heirs male the perpetuity of Chudleigh rectory, with the obligation of paying £42 per annum to the

Precentor of Exeter. On 18th June, 1673, he conveyed to him the perpetuity of the Craslow Pastures, near Aylesbury; the lease of which for a term of 60 years he had granted him about two years before.

It will be remembered that Evelyn refers to a Mr. Prideaux, one of his lordship's trustees, and his refusal to say anything on the matter; but, as a fact, no person of that name appears among the trustees.

The Lord Treasurer's wife was Elizabeth, daughter of William Martyn, of Lindridge, by whom he had seven sons and eight daughters, of whom three sons and seven daughters appear to have survived him.

Lady Clifford survived her husband thirty-six years, dying 21st September, 1709, and was buried near him. He had devised to her the guardianship and education of his children, and made her his sole executrix, and she faithfully discharged her trust.

In conclusion, it is well to record that Lord Clifford was ever ready to encourage genius and merit; and among others Dryden thus records, in his dedication of his translation of Virgil's *Eclogues* to Hugh, second Lord Clifford, his indebtedness to his worthy father: "Your illustrious father was the patron of my manhood. He awakened the remembrances of my royal master. He was that Pollio or that Varus who introduced me to Augustus. In the short time of his administration he shone so powerfully upon me, that, like the heat of a Russian summer, he reopened the fruits of Poetry in a cold climate." And in the dedication of the *Assignment*, the grateful bard proceeds thus: "For my own part, I also am the least among the poets; have yet the fortune to be honoured with the best patron and the best friend; for (to omit some great persons of our Court, to whom I am many ways obliged, and have taken care of me during the exigencies of war) I have found a better Mæcenas in the person of my Lord Treasurer Clifford."

Such was the man of whom, as Devonians, we may justly be proud—one John Prince thought worthy to find a place among the *Worthies of Devon*; and remembering the times in which his lot was cast, we cannot but feel that the Lord Treasurer is entitled to a place in the splendid roll of Devonian Worthies.

HERMAN MERIVALE, C.B.

BY CHARLES MERIVALE, D.D., DEAN OF ELY.

(Read at Newton, July, 1884.)

THE Rev. Samuel Merivale was the first of the family who settled in Devonshire. He was born in Northamptonshire, and educated for the Presbyterian ministry at Dr. Doddridge's academy. He was appointed to the charge of a congregation at Tavistock in the year 1743, married a Miss Shellaber of Bideford, and in later life became theological tutor at the Dissenting Academy in Exeter; he was a scholar of considerable repute, and corresponded largely with the leading divines of his own persuasion in the West of England.

Samuel's only son, John Merivale, inherited from his uncle, Mr. Shellaber, the estate of Annery, near Bideford, which he sold; and he afterwards built a house on the property he had acquired at Barton Place, near Cowley Bridge. John Merivale married Ann, daughter of Herman Kateucamp, a merchant of Exeter, of German extraction, whose younger daughter, Wilhelmina, became the wife of the Rev. Richard Hole, rector of Farringdon, a prominent member of the Exeter Literary Society.

John Herman Merivale, of Barton Place and Bedford Square, London, the only son of John Merivale, was born on the 5th of August, 1779, and was educated at St. John's College, Cambridge. He practised for many years as a barrister in the Court of Chancery, and was appointed in later life a Commissioner in Bankruptcy. He was one of the principal contributors to the *Translations from the Greek Anthology*, published by the Rev. Robert Bland in 1806, a second edition of which appeared in 1813, and was the editor of a third edition, considerably enlarged, which followed in 1833. In 1814 he published *Orlando in*

Roncesvalles, a poem in five cantos; and in 1838 two volumes of his collected *Poems, Original and Translated*; to which he added, in 1844, a third volume of translations from the minor poems of Schiller. He was well known in literary society in London as an accomplished man of letters, and a frequent contributor to the principal reviews of the day; he wrote several pamphlets on the subject of Law Reforms, and was appointed a member of the Commission of 1826 for the reform of the Court of Chancery.

Merivale's Reports of Cases in the High Court of Chancery, extending from the latter part of 1815 to the end of 1817, is still regarded as a standard work of reference in the legal profession. At the time of his death, in April, 1844, he was much occupied with collections for the antiquarian and literary history of Devon, which a few years of greater leisure might have brought to maturity.

John Herman Merivale married Louisa Heath, daughter of the Rev. Dr. Drury, of Cockwood House, Dawlish, formerly Head Master of Harrow School, by whom he had twelve children. Of this numerous family the eldest was Herman, the subject of this notice, who was born at Cockwood on the 8th of November, 1806.

Herman Merivale was educated at Harrow, and left, as captain of the school, at the end of 1823, and was admitted at Oriel College under Dr. Copleston. In 1825 he was elected to an open scholarship at Trinity College, and in the same year obtained the "Ireland," the earliest "University Scholarship" at Oxford, the foundation of which seemed to mark an academical era. He proceeded to his degree in due course in the first class of Classical Honours, and was soon after elected Fellow of Balliol College. Having decided to study for the Bar, he was presented with the first "Eldon Scholarship" for law students, in recognition of the distinction he had already acquired.

Herman Merivale was called to the Bar in 1832, and practised on the Western Circuit. He was married on the 29th of October, 1834, at Dawlish Church, to Caroline Penelope, eldest daughter of the Rev. William Villiers Robinson, and sister of Sir George Stamp Robinson, Bart., of Cranford, Northamptonshire. In 1841 he was appointed Recorder of Falmouth, Helston, and Penzance.

In 1837 he was elected to the Chair of Political Economy at Oxford, of which again he was the first occupant; and in 1841, in compliance with the terms of the Foundation, he published his *Lectures on Colonization and Colonies*, in which

he especially considered the principles of what he styled the "Art of Colonization," as connected with emigration, employment of labour, and disposal of public lands, embracing the subjects of most general public interest at the time.

In 1847, his name being thus brought into notice, Mr. Merivale was offered the post of Assistant Under-Secretary for the Colonies, and in the following year he succeeded Sir James Stephen as permanent Under-Secretary. In 1859 he was transferred to the permanent Under-Secretaryship for India, with the distinction of C.B.

In 1870 he received the honorary degree of D.C.L. at Oxford.

From 1836 to 1847 Mr. Merivale resided at No. 2, Cambridge Place, Regent's Park; from 1847 to 1865 at 26, Westbourne Terrace, Hyde Park; and from 1865 to 1874 at 13, Cornwall Gardens, South Kensington, where he died on the 8th of February, 1874, having succeeded, on his mother's death in the previous year, to the family estate at Barton Place, and leaving a son, Herman Charles, and a daughter, Isabella Frances, married to her cousin, Peere Williams Freeman, Esq. A second daughter, Agnes, married to Townsend Trench, Esq., predeceased him in 1872. He was buried in the West London Cemetery.

On the expiration of Mr. Merivale's fellowship, and his marriage in 1834, he found it requisite to devote a large portion of his time and thoughts to writing on the various subjects which engaged his interest, and on which he had accumulated great stores of information. The habit of composition thus commenced, continued, and perhaps grew upon him to the last. The remarkable activity with which he persisted in the exercise of his pen in the midst of professional and official occupations, is shown in the lists appended, of his contributions to the journals of the day; but even these are by no means complete.

Besides the work on Colonization, mentioned above, Mr. Merivale published, in 1865, a selection from his contributions to periodical literature, together with some other independent compositions, in a single volume, to which he gave the title of *Historical Studies*, and in his copy of that work Lord Lytton (then Sir Edward Bulwer-Lytton), who had been Secretary for the Colonies in Lord Derby's second administration, wrote a minute of his appreciation of the author, a transcript of which is inserted, by permission, in the appendix. (See No. 2.)

In 1867 Mr. Merivale published, in two volumes, the

Memoirs and Correspondence of Sir Philip Francis, which had been designed and commenced by Mr. Parkes, and he also wrote the second and concluding volume of the *Life of Sir Henry Lawrence*, the first volume of which had been written by Sir Herbert Edwardes, both volumes appearing as their joint production in 1872, and being followed by a second edition, in one volume, in 1873.

It will be seen that the eminent talents and acquirements which Mr. Merivale possessed were, to a great extent, studiously withdrawn from the public eye; but the estimation in which they were held by those who knew them may be inferred from some notices of his death which appeared in the journals of the day, and of which copies are subjoined, together with an extract from a sermon preached in the Temple Church, by the Rev. Dr. Vaughan, on the 15th of February, 1874.

Brief notices appeared also in the *Athenæum* and *Academy* of the previous day.

APPENDIX No. 1.

Letter from Sir E. Bulwer-Lytton to Herman Merivale on the former resigning the Secretaryship for the Colonies on the 11th of June, 1859.

"MY DEAR MERIVALE,—I enclose you an official letter in acknowledgment of the aid derived from you and the other gentlemen in the office. I send it to you two or three days before my actual withdrawal in favour of my successor, in order that you may kindly inform me if I have omitted any recognition of service which I ought to have made. Nor can I send this mere formal expression of sincere gratitude for assistance always valuable, always rendered in the kindest spirit, without adding one word of thankfulness, privately and directly, to yourself for all the advantage I have derived in coming into familiar communication with a mind so richly stored and so admirably balanced. That benefit is not felt in official business alone; it must communicate itself in many latent channels of thought and action. The great stepping-stones of intellectual life are at its points of contact with original thinkers. Thus it re-examines and corrects views it had before taken; thus it hoards up insensibly suggestions that recruit ideas and influence its course of action. Not the least memorable of such events in my life has been my connection with yourself. Accept, then, thanks for services of which you were scarcely aware, as well as for those which are more evident; and believe in the sincere esteem and admiration of your attached

"E. B. L."

APPENDIX No. 2.

The following remarks are taken, by permission, from a MS. note made by the late Lord Lytton in his copy of Mr. Merivale's *Historical Studies* :

"The author of this book is one of the most remarkable men I have ever met. The main character of his intellect is massiveness, and it is the massiveness of gold. Perhaps as a critic, for which he has most of the fundamental qualities, he occasionally errs from the combative quality of an advocate; that is, he will sometimes crush some other critic (see papers on Voltaire, Rousseau, Goethe) without sufficient consideration for the cause, which cause is the person or thing criticised, no matter what rubbish advocates for or against have uttered. Perhaps as a writer he has not always done justice to the sterling value of his material by the pains taken in the elaboration of its form; viz., that he is contented to write well where, with such intellect and such stores, he ought, if he spent three months on a page, to have been contented with nothing less than writing wonderfully well. Such as he is, with all merits and drawbacks, he belongs to the very highest order of mind in my time and country. I can compare him to no other of less calibre than Macaulay, for whom I have an enthusiastic admiration; and the difference between them I believe to be this, that no man of much merit could form his opinion by Macaulay, and that a man, however powerful his mind might be, would form his opinion from Herman Merivale. While assuming both to have inherited or acquired an equal amount of gold, Macaulay often spins out his gold in thread, and Merivale leaves his gold in blocks. Macaulay is the finer artist, Merivale the more original thinker; and each might have been improved in his own way, if great men ever were improved, by criticism, which they never have been and never will be. The best criticism is enlightened admiration, as the best of Addison's works prove (apart from creative character, like his . . . of Sir Roger de Coverley) in his essays on Milton;* and the moment a critic blames a great author he is sure to be wrong, as Scaliger is whenever he blames Horace, even the *Ode to the Roman People*, and Merivale is whenever he blames Goethe or Schiller, and Macaulay is when he attempts to depreciate Goldsmith, certainly a smaller man than Goethe or Schiller. But Macaulay and Merivale are men to whom, in proportion to our respect for those laws of rank without which we should all be clodhoppers, we take off our hats, with still greater if we presume to cross swords with them.

"E. B. L."

* The sentence is evidently imperfect and partly illegible.

APPENDIX No. 3.

Obituary Notice in the "Pall Mall Gazette" of 9th February, 1874.

"Mr. Herman Merivale died yesterday morning, after a sudden illness of two days, following some years of failing health. He was a member of a small, but important and characteristic, section of English society, and, though he never obtained, and indeed was little disposed to seek, the degree of acknowledged eminence to which both his talents and his services entitled him, he was an exceedingly able and a most distinguished man. Mr. Merivale was born in 1806. He was the son of Mr. John Herman Merivale, a barrister of both professional and literary distinction, his best known books being a translation of some of Schiller's poems, and certain Chancery Reports, if indeed Reports deserve to be called books. He was the father of two very distinguished men—the subject of this notice, and his younger brother, Dr. Charles Merivale, the author of *The Romans under the Empire*. Each of the brothers gained the highest University distinction—Mr. Charles Merivale at Cambridge, where for a series of years he took rank among the best classical scholars in the University, and Mr. Herman Merivale at Oxford, where he was one of the first, if not the very first, of the distinguished men who have held the Ireland Scholarship. He also gained a Fellowship at Balliol College. Later in life he was Professor of Political Economy at Oxford, and delivered a set of lectures, which were afterwards formed into his work on Colonization. This work was one of the causes of his long connection with the public service. After taking his degree Mr. Merivale was called to the Bar, and joined the Western Circuit. He was one of the men whose reputation and general position in the profession are disproportioned to their actual practice. Mr. Merivale was fitted by nature for the very first positions at the Bar or on the Bench. He was an admirable speaker, with a gift for legal argument comparable to that of Lord Justice Mellish; but his careful education, his general ability, and his singularly vigorous and masculine taste in all matters of style, indisposed him for the sort of efforts and the level of oratory which are admired at quarter sessions and before provincial juries on a circuit. No man could be more impressive and powerful upon any topic, either of fact or law, which gave him a real opportunity for employing his powers; but he was not exactly the man for the day of small things. There is a certain small number of persons whose ability stands more or less in their way at a certain point of their career, and who would occupy a much more conspicuous position in life, if they were not too sure of their powers to care much about using them in the particular way which earns great success. However, though Mr. Merivale was a man of this class, we are disposed to think that if the present Chief

Justice of England and the present Chief Justice of the Common Pleas, each of whom was on circuit with him, had been asked, in 1847, to say where the three would stand in 1874, they would scarcely have guessed aright.

"In the autumn of 1847 Sir James Stephen retired from the Colonial Office, with which he had been connected for thirty-five years, and Mr. Merivale, partly at his suggestion, was appointed to succeed him as Under-Secretary of State in that department. He held that office until 1859, when the government of India was transferred to the Crown. He then became, in 1859, permanent Under-Secretary at the India Office, and retained the appointment till his death. He was thus Under-Secretary of State in two of the most important departments of government for the long period of twenty-six years and upwards. The position of a permanent Under-Secretary is a very peculiar one; the nature of his bargain with the public is, on the one hand, that he is protected against all responsibility, except to his immediate official superior for the time being, secured in the possession of a moderate income for life, and provided with most interesting duties, the due discharge of which may be of vital importance to the country, and must be a matter of well-founded gratification to himself; on the other hand, he is excluded from all the great prizes of public life, and from all avowed connection with public questions. He may very possibly exercise considerable power in the dark and on sufferance, but he can never adopt and defend his own line of policy on his own responsibility; he has nothing absolutely to expect except a moderate retiring pension after a great length of service, and possibly a title of rather an unmeaning kind. It was very characteristic of Mr. Merivale that when the Duke of Newcastle offered him the rank of K.C.B. he declined it, and casually observed to his family sometime afterwards that he might have had it, but had refused it, as 'he did not see the use of it.'

"Mr. Merivale has been described in the *Times*, with curious infelicity, as a person whose 'name was known to Anglo-Indians as an able and painstaking Under-Secretary, but whose merit as a writer has given him a much wider and more enduring fame.' It would have been difficult to describe him in more inappropriate words. The commonplace epithet 'able' is the only one which is in the least degree intelligible, and it is far too weak. Mr. Merivale's real position at the India Office was that of a man of the highest capacity, who neither was, nor was expected to be, particularly 'painstaking,' but who had to advise and assist the Secretary of State at every step in the strange function with which he is invested of superintending and criticising the government of an empire, without initiating a single measure connected with it. How much ability Mr. Merivale employed in the discharge of this duty can be known only to his immediate superiors and associates. That it must have been great is obvious to everyone who knew

the man. His characteristic quality was the vigour and promptitude of his judgment upon every kind of subject, and his power of expressing and defending whatever opinion he might form. His whole manner and aspect, until failing health weakened him, were somewhat combative and formidable. He was ready, prompt, and vigorous in mind and body, but rather careless (like a man confident of his own strength and resources) than painstaking. His manner, however, indicated a singularly affectionate, warm, and kindly disposition. There was no malice or tyranny in his self-assertion, and, what was more singular, not a touch of vanity. His temper, too, was essentially pious and reverential, though in a very quiet, unconscious way. The notion that his books were calculated to give him 'wide and enduring fame' appears to us foolish. We are not likely to underrate his literary powers. From the first establishment of the *Pall Mall Gazette* to his death he was a most valuable and frequent contributor to these columns. There can be little doubt that, if he had made a serious business of literature, he might have earned wide and enduring fame; but he was not at all an ambitious man, nor had he that restless energy of mind which makes unceasing labour a necessity to some people. When he had done his official duties thoroughly well he was content to amuse himself, and his writings, after he received his appointment in 1847, were little more than amusements. Indeed, both the *Life of Sir Philip Francis* and the *Life of Sir Henry Laurence* were begun by others and handed over to him for completion upon the death of the original authors. His whole career affords a strong illustration of the way in which the institutions of this country and the habits of life of the present day act upon men whose education, ability, general knowledge, and power of mind, are out of proportion to their income and connections. No better work—political, judicial, literary, or professional—is to be had in the world than may be, and under favourable circumstances is to be, got out of such men; but very many of them are either too proud to take the common means of securing popular favour, or are awkward in their attempts to do so, and the consequence, not unfrequently, is a career of obscure distinction, which deeply and enduringly impresses a small circle of friends, but is soon forgotten by the public at large, if indeed the public can forget what they never knew."

APPENDIX No. 4.

Extract from a Notice in the "Economist" of 14th February, 1874.

"It is so long since Mr. Merivale wrote anything on Political Economy, and his time has meanwhile been so much occupied with official and literary labour, that it is hardly known to the general public that he was one of the most acute and best-read political economists of his time. The truth is so, however. He was the

first Professor of Political Economy at Oxford, and in that capacity delivered and published a series of very remarkable lectures on 'Colonization,' which attracted great attention at that time. The controversies with which they deal have now passed away. The 'Wakefield' system of colonization, after stimulating the growth of our colonies at the Antipodes, is now abandoned; but anyone who has any curiosity on the subject will find that, while it was yet an untried suggestion, Mr. Merivale accurately criticized its merits and its defects, and showed how far it would succeed, and where it would fail, almost as correctly as experience afterwards proved. There are few acuter arguments in economical literature, and still fewer better written. Though in later life Mr. Merivale wrote little or nothing on political economy, he always retained his interest in it, and was fond of discussing any point of it with an eagerness and an accuracy in which the present generation are deficient. Some of those who have heard him at his best on those topics could not but think that neither his literary efforts nor his official labours in a rather secluded department gave an adequate scope to his peculiar abilities. There was just a touch of genius about him, which he had not enough means of showing, and for which the world did not give him credit."

APPENDIX No. 5.

Extract from a Sermon preached by Dr. Vaughan in the Temple Church on the 15th of February, 1874.

"It is not without special significance that funeral music has been in our ears to-day, reminding us of the departure of one who loved this 'house' tenderly, and who was himself one of its honoured heads and rulers—a man of extraordinary academical promise; a scholar, spoken of by his contemporaries at Oxford as 'one of the two best educated men'—you can almost guess the other—in his University generation; a diligent servant of the State in offices, not of prominence, but of labour; a man of deeds more than of words, and of thoughts larger and higher than either; a man veiling, rather than vaunting, alike his great powers and his warm affections, has passed from the midst of us, scarce yet in the fulness of his years, and we mourn him, and would make mention of him to-day. He belonged to that order of true and real men—would to God there were more of them!—who are not for show, but for use, who scramble not for place or title, but do an unobtrusive work well, cultivate intellect, not for its emoluments, but for its blessings, 'occupy' the assigned 'talent' faithfully, and leave a sorrowful blank behind them in their home. May we, when our call comes, leave behind us as honourable, as pure a name, as large a place in the hearts of those who survive, as good an example to those who come after, of a life lived in the fear of God and in the hope of a world to come."

APPENDIX No. 6.

Articles by Herman Merivale contributed to the "Foreign Quarterly Review."

Vol.	Year.	
1.	Nov., 1827.	Daru's <i>Historie de Bretagne</i> .
3.	Sept., 1828.	French Histories of the Revolution in England.
12.	July, 1832.	Béranger.
13.	Aug., 1834.	German Military History (†).
14.	Dec., 1834.	Frederic the Great.

APPENDIX No. 7.

Articles in the "Edinburgh Review."

Vol.	Year.	
55.	1832.	Rossetti's Danta.
57.	1833.	Characteristics of Goethe.
59.	1834.	Taylor's Fanaticism.
60.	1835.	Flinter's Porto Rico.
62.	1835.	Thirlwall's Greece.
63.	1836.	Raumer's England in 1835.
63.	1836.	Cowper.
64.	1836.	Walsh's Constantinople.
65.	1837.	Hazlitt.
65.	1837.	Strafford by Browning.
66.	1838.	Senior's Political Economy.
66.	1838.	Pusey on the Fifth of November.
67.	1838.	Jardine on Torture.
68.	1838.	Southey.
69.	1839.	Statistics of French Population.
69.	1839.	Shelley.
70.	1840.	Adam Smith.
71.	1840.	Runjeet Singh.
72.	1841.	Hallam's Literature.
73.	1841.	Mrs. Hamilton Gray.
74.	1842.	Borrow's Zincahi.
74.	1842.	Pictorial History of England.
75.	1842.	Moore.
76.	1843.	Arnold on Modern History.
78.	1843.	Travelling Physicians.
78.	1843.	Life in Mexico.
80.	1844.	Harris's <i>Æthiopia</i> .
83.	1846.	Lyell's Travels in North America.
85.	1847.	Les Rues de Paris.
86.	1847.	Macgregor: Progress of America.
90.	1849.	Tyndall's Sardinia.
92.	1850.	Das Goethefeier.

Vol.	Year.	
93.	1851.	Handbook for Devon and Cornwall.
94.	1851.	Dixon's Life of Penn.
95.	1852.	Mallet du Pan.
95.	1852.	Squier's Nicaragua.
96.	1852.	Lady Theresa Lewis's Lives, &c.
98.	1853.	Vehse : Austrian Court.
100.	1854.	Sahara, &c.
101.	1855.	Gregorovious : Corsica.
103.	1856.	Collier's Shakspeare.
104.	1856.	Forbes's Alps.
106.	1857.	Marmont's Memoirs.
107.	1858.	San Francisco.
108.	1858.	Gladstone's Homer.
111.	1860.	Collier's Shakespeare.
113.	1861.	Wilkins's Ballads.
113.	1861.	Hayward's Mrs. Piozzi.
116.	1862.	Troyon, Habitations lacustres.
119.	1863.	Finlay's Greek Revolution.
120.	1863.	Louis Blanc's Revolution.
120.	1863.	The Colonial Episcopate.
122.	1864.	Archbishop Whateley.
124.	1865.	Palgrave's Arabia.
125.	1867.	Earl Grey's Correspondence.
126.	1867.	Rogers on Wages and Prices.
128.	1868.	Sybel's French Revolution.
129.	1869.	Milman's St. Paul's.
129.	1869.	Lives of Lyndhurst and Brougham.
130.	1869.	Crabb Robinson.
132.	1870.	Stanhope's Queen Anne.
132.	1870.	Galton on Hereditary Genius.
134.	1871.	Land Tenure.
135.	1872.	Life of John Hookham Frere.
138.	1873.	Paston Letters.
139.	1874.	Devotion of the Sacred Heart.

APPENDIX No. 8.

Articles in the "Quarterly Review."

Vol.	Year.	
94.	1853.	Missions in Polynesia.
95.	1854.	Melanesian Missions.
105.	1859.	George the Third and C. J. Fox.
107.	1860.	Madame Récamier.
111.	1862.	Miss Cornelia Knight.
114.	1863.	Washington Irving.
118.	1865.	Carlyle's Frederic the Great.
119.	1866.	Caricature, &c., in Literature and Art.
122.	1867.	Character of George III.

WAS ST. BONIFACE AN IRISHMAN?

BY THE REV. CANON BROWNLOW, M.A.

(Read at Newton Abbot, July, 1884.)

SAINT BONIFACE IN HIS RELATIONS WITH THE IRISH.

I. *Was Saint Boniface an Irishman?*

WHEN the President of the Devonshire Association selected St. Boniface for the subject of his last Inaugural Address, some rather foolish remarks were made upon that selection by one of the local papers, finding fault with him for attempting to call back to life the dead bones of a saint, who had been buried more than a thousand years. But the very object of this Association is to call back to life, as far as possible, the long-buried past, and to make the Devonshire of the present day know and realize what was the Devonshire of the past, as far back as history can trace it. I need not therefore apologize for attempting to contribute something towards our knowledge of the earliest and greatest of Devonshire Worthies, Wynfrith of Crediton, whom the whole of Europe venerates as St. Boniface, the apostle of Germany.

The late Mr. King, of Crediton, has successfully vindicated the Devonian birthplace of St. Boniface, and his arguments have convinced Mr. Edward Freeman, the historian of the Norman Conquest, that the difficulties put by Dr. Guest against the traditions of Crediton are not sufficiently valid to shake those traditions. It will, however, be a new idea to many that a learned Irish Archæologist, Dr. Moran, the recently-appointed Catholic Archbishop of Sydney, has seriously, in an elaborate paper, published in the *Irish Ecclesiastical Record*, maintained that St. Boniface was an Irishman. Twenty years ago he asserted that "St. Boniface,

the illustrious martyr and apostle of Germany, was a native of Ireland. Passing in his youth to England, he received in its monasteries the name of Winfred; subsequently, as archbishop of Mentz, and founder of the great monastery of Fulda, he bore the name of Bonifacius." (*Essays on the Early Irish Church*, p. 151.) In his recent paper, Dr. Moran considerably modifies his former statements. In reply to the testimonies brought forward to prove that our saint was a native of England, he says: "All this only proves that St. Boniface, by accident of birth, was born at Crediton, in Devonshire; but it affords no proof that St. Boniface was not an Irishman." But we may ask, What grounds can Dr. Moran bring forward to support his theory? He shall speak for himself.

"The principal witness in favour of Ireland's claim is the chronicler Marianus Scotus." The Archbishop gives an interesting account of Marianus, or Moelbrigte, as he was called in Ireland. He was born in 1028, educated at Moville, in County Down; and going over to Germany, after two years spent in the monastery at Cologne, he became a monk at Fulda in 1058. In 1069, with the consent of the abbot, he went to reside at Mentz, by the invitation of the Archbishop, and continued there until his death in 1082. The principal work by which Marianus is known is his *Chronicle*, which became the groundwork of most of the later chronicles, particularly in England. The original MS. of this *Chronicle*, written by an Irish scribe at Marianus' dictation, has been discovered in the Vatican library, and is found to be free from a number of spurious entries, which had brought the *Chronicle* into disrepute. Dr. Moran sums up the evidence of Marianus thus:

"(a) He tells us that both the father and the mother of St. Boniface were Irish. (A.D. 715.) 'Hic (Papa Gregorius) erat vir castus et sapiens, qui Bonifacium, patre atque etiam matre Scottum, ordinavit Episcopum ad sedem Moguntinum, et per eum in Germania verbum salutis prædicavit, gentemque illam in tenebris sedentem evangelica luce illustravit.'

"(b) He expressly calls St. Boniface an Irish Archbishop. (A.D. 723.) 'Juramentum Sancti Scotti Archiepiscopi Bonifatii (*sic*) in ecclesia Sancti Petri Apostoli coram Papa Gregorio Secundo.'

"(c) In the marginal additions to the text made in Marianus' own hand, St. Boniface is said to have been from Ireland. 'Iste enim Bonifatius de Hibernia, missus est cum Willebrordo Anglico Episcopo, ut in vita ejus Willebrordi legitur.'

"(d) Passages from Pontifical letters are cited by Marianus,

addressed to the Irish Boniface, Archbishop of Mentz, thus: 'Epistola Gregorii ad Bonifacium Scottum Moguntinum Archiepiscopum. Epistola Zachariae Papae ad Bonifacium Scottum Archiepiscopum Moguntinum data nonas Januariar,' &c. Again, 'Alia epistola Zachariae Papae ad Bonifacium Scottum Archiepiscopum Moguntinum.'

"(e) When recording the destruction of the monasteries of St. Gall and Fulda, in the Hungarian incursions, he links these great monasteries together as founded by Irish saints. (A.D. 1037.) 'Monasteria sanctorum Scottorum, Sancti Galli et Sancti Bonifacci, igne consumuntur.'

Such are the proofs upon which Archbishop Moran relies to bear out his claim for the Irish parentage of St. Boniface. He supplements them indeed by the testimony of Trithemius, the learned Abbot of Spanheim, who died at Würzburg in 1516; and who, in his treatise, *De Scriptoribus Ecclesiasticis*, assigns St. Boniface to Ireland. Dr. Moran attaches importance to the testimony of Trithemius, because, as he says, "he held in his hand the traditions of Mentz and Fulda; that is, of the See of St. Boniface, and of the great monastery which he founded." And when he "accepts as correct the statements of Marianus, relating to St. Boniface, he becomes voucher to us that those statements are conformable to the traditions of the spiritual children of St. Boniface."

I have no desire to say a word in disparagement of the learning or critical power of either Trithemius or Marianus. Still, they were men, and therefore liable to make mistakes; and if we find that their assertions are not consistent with the testimony of earlier writers, who had equal, if not better, opportunities of obtaining information, we may safely set their testimony aside as inadequate.

To the traditions of Fulda we may oppose the traditions of the English Church. In 755, as soon as the news of the martyrdom of St. Boniface reached England, a council was held, in which it was determined to celebrate the anniversary; and Cuthbert, Archbishop of Canterbury, wrote to Lullus, the martyr's successor at Mentz, congratulating him on the glory of the martyr, in which the English nation shared, "because the nation of the English, a pilgrim from Britain, had the merit of sending forth from herself in so laudable a manner such an excellent soldier of Christ, with a multitude of well-educated and highly-trained disciples to spiritual conflicts in the sight of all, and for the salvation of many souls, through the grace of Almighty God. . . . Wherefore in our general synod we determined to celebrate solemnly,

with a repetition year by year, the day of his entrance into life, and of that company that were martyred with him; implying by this, that we specially desire him as a patron for us, together with blessed Gregory and Augustine, and that we undoubtingly believe that we have him as such before Christ the Lord, whom in his life he ever loved, and in his death, as his grace merited, he magnificently glorified."*

The feast was marked in all the ancient English calendars, as may be seen in several versions of the Sarum calendar given in Mr. Maskell's *Monumenta Ritualia*. It has even held its ground in the Calendar of the Book of Common Prayer among the Black Letter Saints. Thirty years ago, when Catholic bishops from all parts of the world were assembled in Rome, the German and English bishops petitioned the Holy See, that the mass and office of St. Boniface might be conceded, if not to the whole Church, "at least to the whole of Germany and to the whole of England, that in St. Boniface England may venerate her son, and Germany her apostle."† Thus by a tradition of eleven hundred years the Catholics of England have claimed St. Boniface as an Englishman both by birth and race. No such claim has ever been put forth by the Irish Church, although learned individuals, such as Marianus in the 11th, and Dr. Moran in the 19th century, have advanced the theory of our saint's Irish origin.

But are the traditions of Fulda fairly represented by the statements of Marianus? About the time that Marianus was a monk there, while Egbert, who died in 1078, was abbot of Fulda, the monks wished to have a Life of St. Boniface compiled on a somewhat larger scale than the biography by Willibald. They entrusted this work to a monk of the name of Othlo, whether of their own monastery or not is not certain; but they sent him to Rome with letters to Pope Leo IX., in order that he might get all the

* "Gratias agimus: quod tam egregium Christi militem cum multis bene educatis et optime instructis discipulis gens Anglorum advena ex Britannia meruit palam omnibus ad spiritales agones et ad multarum per Dei omnipotentis gratiam salutem animarum de sese procul laudabiliter emittere. . . . Unde in generali synodo nostra, ejus diem natalicii illiusque cohortis cum eo martyrizantis insinuantes statuimus annua frequentatione sollempniter celebrare: utpote quem specialiter nobis cum beato Gregorio et Augustino et patronum quaerimus et habere indubitanter credimus coram Christo Domino, quem in vita sua semper amavit et in morte, ut ipsius meruit gratia, magnifice clarificavit." (S. Bonif. *Epist.* 114. Ed. Würdtwein.)

† "Quod in S. Bonifacio suum haec filium, suum illa veneretur apostolum." (*Decret. S. Rit. Cong.* Die 29. Martii, 1855.)

documents necessary for the perfection of the Life. Othlo begins his biography thus:

"When the nation of the English, subdued to the yoke of the holy faith by the apostolate of Pope St. Gregory, by the aid of his merits pleading for them, began to shine out beyond many nations in the productions of saintly men, and brought forth many lights of holy Church for the enlightenment of the various blindnesses of men's hearts, among the lights of this world (this nation) also had the merit of bringing forth into this world Saint Boniface, like some morning star—brighter than the rest of the stars."*

If the tradition of Fulda, even in Marianus' time, had been in accordance with the statements of Marianus, it is inconceivable that Othlo would have dedicated to the abbot a biography at variance with that tradition in its opening paragraph.

The *Chronicle* of Marianus, as has been said, formed the groundwork of many later chronicles, especially in England. But although English chroniclers extolled the learning and general accuracy of Marianus, they did not follow him blindly, and they rejected his theories when they considered them without sufficiently strong foundation. Thus William of Malmesbury, whose praises of Marianus are quoted by Dr. Moran, says of our saint: "Boniface, Archbishop of Mentz, an Angle by nation, who was subsequently crowned with martyrdom," &c. (*Chron.* I. i. c. 4.)

Florence of Worcester, who avowedly adopted Marianus as the basis of his own *Chronicle*, died in 1118. Two ancient MSS. of his *Chronicle* are preserved in the library of Trinity College, Dublin. Through the kindness of a friend I have been able to obtain from the librarian a careful examination of these MSS. One of them states: "Pippin, by the decree of Pope Zachary, is anointed Emperor by Boniface, Archbishop of Mentz, an Englishman by nation . . . and to him (that is to Boniface) succeeded Lull, also himself an Englishman by nation."† The other MS. records St. Boniface's ordination (715), and speaks of him as "by nation an Englishman."‡

* "Cum gens Anglorum sacrae fidei jugo per S. Gregorii Papae Apostolatum subdita, ejus suffragantibus meritis, in sanctorum virorum procreatione prae multis nationibus splendescere coepisset, multaque lumina sanctae ecclesiae, quibus variae obcaecationes illustrarentur, protulisset, inter hujus mundi lumina sanctum quoque Bonifacium velut Luciferum quendam, caeteris sideribus clariorem, huic mundo edere meruit."

† MS. E. 6, 4. fol. 56: "Pippinus decreto Zacharie Pape a Bonifacio, Moguntino, archiepiscopo, genere Anglo, unguitur in imperatorem . . . cui (i.e. Bonifacio) successit Lull, et ipse genere Anglus."

‡ MS. E. 5, 23.

Four years before Marianus entered Fulda, there died at the Abbey of Reichenau—"Augiae Majoris"—a monk known in the world as Hermann, Count of Vöringen, surnamed "Contractus," from a natural deformity, which did not prevent his being regarded as one of the most learned men of his age, philosopher, poet, astronomer, and the author of some of the most celebrated hymns of the Church—the "*Salve Regina*" and the "*Alma Redemptoris*." He compiled a Chronicle from the creation of the world down to the year of his death, 1054. In this Chronicle, under the year 717, he says: "Hoc tempore Winfridus, qui et postea Bonifacius, genere Anglus Germaniae gentibus verbum salutis praedicat, auctoritate Gregorii Papae II." *

The same testimony is borne by more ancient chronicles. Many of the ancient monastic Annals are to be found in the two first volumes of Pertz's *Monumenta Germanica*. Pertz has separated off the Annals of Fulda by Enhard, extending from 630 to 838, from their continuation by other hands. Enhard makes the following entry:

"717. About this time Wynfrid, who afterwards, when he was ordained Bishop, received also the name of Boniface, a Catholic doctor, an Englishman by nation, came first to Rome, and then, by the authority of Gregory the Pope, to France, to preach the word of God." †

The Annals of other monasteries are in perfect accordance with those of Fulda. Thus Regino of Treves, whose epitaph, with the date of 915, was found in the 16th century, records:

"650. About this period Gregory was made Pope; he ordained Bishop Boniface, who sprang from Britain, and through him preached the word of salvation in Germany," &c. ‡

The Annals of Lauresheim, closely connected with Fulda, say:

"746. Bonifacius, a holy man of the race of the English," &c. §

The *Annales Xantenses*, which give the traditions of Utrecht:

"752. There suffered our holy father Boniface, an apostolic man, and adorned with all wisdom, who derived his noble origin from

* CANISIUS *Thesaurus Monum.* Ed. Basnage, Tom. iii. 239.

† "717. His temporibus Wynfridus, qui et postea, cum episcopus dinaretur, Bonifacii nomen accepit, Doctor Catholicus, natione Anglus primam Romam, deinde cum auctoritate Gregorii Papae in Franciam ad praedicandum verbum Dei venit." (PERTZ, *Mon.* T. i. 338.)

‡ "An Dom. incarnationis 650 . . . circa haec tempora . . . Gregorius Papa constituitur; hic Bonifacium ex Britannia ortum episcopum ordinavit, et per eum in Germaniam verbum salutis praedicavit," &c.

§ "746. Bonifatius, vir sanctus de genere Anglorum," &c.

the nation of the English, was there also most religiously trained for his holy vocation," &c.*

These extracts may be found in Pertz, and he appends to the Life of St. Boniface another set of fragments by an unknown priest of Mentz, who relates the deposition of the unworthy Bishop Gewelib, and says: "At that time the venerable Boniface, of the nation of the English, under the Lord's guidance from Britain, entered into Germany." &c.†

But the strongest of all proofs of St. Boniface's English nationality is to be found in his own writings and correspondence. Surely he may be allowed to have been accurately informed of the nationality of his own parents; and if Marianus' assertion that his "father and mother were both Irish" had any foundation in fact, it is difficult to understand how so remarkable a circumstance should have failed to come out in that close and affectionate correspondence which St. Boniface kept up through all his life with so many friends in England. On the contrary, not only is there no indication of Irish extraction, but there is direct proof in so many words that St. Boniface was a Saxon both by birth and parentage.

He writes to Pope Zachary for the solution of some questions of discipline, and cites the decision of a Council of London: "The Synod and Church in which I was born and brought up, in Saxony beyond the sea, which was first founded and set in order by the disciples of St. Gregory, the archbishops Augustin, Laurence, Justus, and Melito," &c.‡ Archbishop Moran contends that this passage only proves that St. Boniface was *born* in England, like Cardinal Wiseman and others of Irish extraction. But the passage does not stand alone. The deep interest that he always took in English affairs had its foundation in the ties of blood which bound him to the Saxon race. His terrible letter of warning to the dissolute young king of Mercia, Ethelbald, was dictated, as he tells Herefrith, "by nothing else but the pure friendship of charity, and because we who are on our pilgrimage here by the command of the Apostolic See were

* "752. Passus est sanctus pater noster Bonifacius, vir Apostolicus et omni sapientia adornatus, qui de Anglorum gente nobilem ducens originem, ibidem in sancto proposito religiosissime educatus," &c.

† "Eodem tempore venerabilis Bonifacius, domino ducente, de Britannia, Anglorum gente, Germaniam est ingressus," etc.

‡ "Synodus et ecclesia, in qua natus et nutritus fui, id est, in transmarina Saxonia, Lundinensis Synodus, quae imprimis a discipulis sancti Gregorii, id est, Augustino, Laurentio, Justo, Melito archiepiscopis constituta et ordinata fuit," &c. (Epist. LII. Würdtwein.)

born and bred of the same race of the English, and we rejoice and are gladdened by the good works and praises of our own nation; but we are afflicted and made sad by its sins and the reproaches cast upon it. For we suffer it as a disgrace to our race when it is said, either by Christians or Pagans, that the nation of the English, disdaining the custom of other nations, and despising apostolic precept, nay even the ordinance of God," &c.* Again in his letter to all bishops, priests, deacons, canons, clerics, abbots, abbesses, monks, and nuns, "yea, generally to all Catholics who fear God, begotten of the stock and lineage of the English," he styles himself "one of the same race by birth, Boniface, who is also Wynfrith." And he implores them to beseech God for the conversion of the pagan Saxons: "Have pity on them, because they themselves even are wont to say that we are of one blood and one bone with them."†

With such evidence from his own letters before us, it seems as difficult to maintain that St. Boniface was not an Englishman, as it would be to attempt to prove that St. Paul was not a Jew.

How Marianus arrived at his very positive conclusion on the matter it is impossible for us to ascertain. Whether he evolved it from his own inner consciousness, or whether he had some Celtic MSS. on which he relied, we cannot tell. Certainly the way in which he parades it, in the titles to the Epistles of St. Boniface and Pope Zachary, has the appearance of a new and original discovery. Dr. Moran seems to forget that these titles are inserted by the editor. There are no titles to the letters in Othlo's life of St. Boniface. But Marianus was so anxious to impress upon his readers his new theory, that he could not resist adding after the name, "Boniface," a reminder, "an Irishman you know, *Scottum*." Dr. Moran says that he does not always use this designation. Perhaps he considered that he had so firmly established his theory that it required no more repetition. Dr. Moran

* "Propter nihil aliud direximus, nisi propter puram charitatis amicitiam, et quod de eadem gente Anglorum nati et nutriti hic per praeceptum apostolicæ sedis peregrinamur, bonis et laudibus gentis nostræ lætamur et gaudemus: peccatis autem ejus, et vituperationibus tribulamur et contristamur. Opprobrium namque generis nos trahi patimur sive a christianis sive paganis dicentibus, quod gens Anglorum spreto more caeterorum gentium, et despecto praecepto apostolico, imo Dei constitutione," &c. (Epist. LXXI. Würdtwein.)

† "Omnibus Catholicis Deum timentibus de stirpe et prosapia Anglorum procreatis, ejusdem generis vernaculus, Bonifacius . . . ut Deus convertat ad Catholicam fidem corda paganorum Saxonum. . . . Miseremini illorum, quia et ipsi solent dicere de uno sanguine et de uno osse sumus." (Epist. XXXVI. Würdtwein.)

anticipates the objection that Marianus allowed his patriotic feelings to warp his judgment, by giving instances of his candour, such as his describing St. Willibrord as an Englishman; whereas other annalists, from his having studied in Ireland, have called him an Irishman. I do not wish to question Marianus' general candour and accuracy. All that I contend for is, that in this instance we cannot set aside the overwhelming evidence for the English nationality of St. Boniface on account of Marianus' unsupported authority.

A further, and in many respects a more interesting question is the relation in which St. Boniface stood towards the Irish missionaries, with whom he came in contact in Germany and France. Some have accused him of having treated Irishmen with exceptional harshness, while I am glad to be able to agree with Dr. Moran in ascribing his severe language about the Irish Virgilius and Sidonius to "not any national antipathy, but rather his apostolic earnestness and love of the Faith." To discuss this matter as it deserves, with a sketch of the circumstances in which St. Boniface found himself, and the errors or supposed errors, concerning the Antipodes, and other subjects with which he had to contend, would occupy more time than I can devote to it at present.

In connection with St. Boniface, I should like to propose some questions which have presented themselves to my mind; and which I should be glad to see investigated by Members of this Association.

1. As there is no record of a monastery at Exeter itself in the seventh or eight centuries, may not the "Adescanastre" where Wynfrith was educated have been at Exminster, the name of which place tells of a monastery having once been there?

2. In Dorsetshire there is a village called Wynfrith-Newburgh, and the surrounding district is called the "Hundred of Wynfrith," or Wynfrot, as it is styled in *Domesday Book*. The church is dedicated to St. Christopher, and the locality is full of records of the Newburgh family. Can any trace of a connection with St. Boniface be discovered in or about this village?

3. Are there any churches or chapels dedicated to St. Boniface or to St. Wynfrith in Devonshire or Dorsetshire?*

* In answer to this last question, I have been informed that the church of Manaton, near Bovey Tracey, and also that of Branscombe, near Sidmouth, are dedicated to St. Winfred, or Wynfrith.

ON RECENT EXCAVATIONS AT BUCKFAST ABBEY.

BY J. BROOKING ROWE, F.S.A., F.L.S.

(Read at Newton Abbot, July, 1884.)

IN the eighth volume of our *Transactions* I gave some account of the History of Buckfast Abbey. The description I was able to furnish of the buildings was very meagre; for the place had been used as a quarry so long, that the foundations were far below the surface of the ground; and the only clue as to the relative positions of the church and domestic buildings was to be obtained from the very scanty remains, and the hints given by Buck and Laskey. But a strange thing has recently come to pass. The modern house, the ruins, and the site of the Abbey, and the rights and belongings of the latter, have passed from private hands into the charge of a religious community, and the place which the Cistercians once knew is occupied by other children of St. Benedict. For the first time for nearly three hundred and fifty years, on the 9th of October, 1882, the divine offices were again sung and said within the precincts of the Abbey of our Lady of Buckfast. Expelled from France, a community of monks, founded by Father John Baptist Muard, has acquired the house and lands, and the religious life has once more commenced at the place hallowed by the memories of probably more than ten centuries.

At the time these modern monks took possession of the Buckfast Abbey they were not aware that they had become the owners of more than the modern house, and the so-called Abbot's Tower. A temporary chapel (a very ugly one) was erected, and plans were drawn for a new church and conventual buildings. Fortunately, however, Mr. St. George Mivart became interested in the matter. He looked up the history of the place, directed the attention of the architect to the drawing of Buck, and the account of Laskey, and

encouraged the monks to undertake the work of excavation; the results of which I have now the pleasure of putting before you.

I stated in my Buckfast History that I considered the church consisted of chancel, transepts, and long nave, with the chapter-house on the south, the normal plan of the Cistercians being followed. The recent excavations, all done by the hands of the monks themselves, under the direction of their companion and friend, the very intelligent and most courteous Father Hamilton, assisted by Mr. Frederick A. Walters, the architect of the community, have confirmed my supposition.

The modern house, built in 1806, covers but a very small space of the ancient site. It was built on the west side of the cloister garth, and apparently but little of the monastic buildings was utilized or incorporated. The vaulted passage, whatever it might have been (there is no doubt, I think, it was connected in some way with the *domus conversorum*), is the only thing that can be identified.

The Abbot's Tower, the *domus conversorum*, and the west wall of the church, and its nave and aisles, formed the western front of the Abbey; the east wall of the so-called Abbot's Tower, and the west walls of the *domus conversorum*, and of the church, being in one line. Further in the same direction was the enclosing wall with the entrance gateway. Two arches still remain, under which the present highway runs; and on the other side are the considerable remains of buildings now—as probably formerly—used as farm buildings connected with the convent. The home grange of the Abbey, the extensive barns and other buildings of which still exist, was a little further north-west, and is now occupied by Mr. Berry.

In indicating the result of the excavations so far I will begin with the church, which runs almost due east and west. According to Mr. Walters's measurements, it is 220 feet long from end to end; the nave is 31 feet broad, taking half of the walls separating it from the aisles; the aisles very narrow, taking again half of the walls separating them from the nave, 12 feet wide. The transepts were small, as nearly as can be ascertained, about 30 feet square. East of each was a small building, probably a chapel. At the east end of the sanctuary are massive foundations, and in the south transept a large block of masonry, which indicates the position of the staircase leading to the monks' dormitory, over the chapter-house and day-room. In the western angle of the south aisle is another

mass of masonry, no doubt the foundation of the winding staircase of the conversi to their dormitory above their living-room.

The whole of the foundation walls are continuous throughout the church, the only apparent break being in the wall of the north aisle, not far from the western wall, where a space of about 5 feet is left. The reason for this is, no doubt, to be found in the character of the ground, which induced the old builders to carry the walls through, rather than rely on foundations for the base of the piers only.

Leaving the church by the south transept, we reach the foundations of what was probably the sacristy, and thence enter the chapter-house. This was a chamber 44 feet long by 24 feet broad. Between this and the frater, or monks' day-room, going south, are two spaces, which Mr. Walters thinks indicate the position of a slype and of the stairs to the floor above. The frater is 44 feet long by 28 feet broad, and this is the last room on the east.

Turning now westwards, we are in the lavatory, which with the refectory and kitchen, the one 49 feet long by 21 feet broad, the other 29 feet long by 21 feet broad, occupy the whole of the south side; and the *domus conversorum*, with dormitory over, a building apparently about 150 feet long by 24 feet broad, completes the western side.

These various buildings enclose the cloister and cloister garth, which has the south wall of the church on one side, the chapter-house and frater on the east, the refectory and kitchen on the south, and the day brethren's dwelling on the west. The foundations of the whole of these buildings have been uncovered, and the plan disclosed in a most satisfactory manner. The work was laborious, for such was evidently the greed for stone, that it was for the most part removed for a considerable distance below the level of the ground, and it is evident that it was only when the hardness of the mortar and the depth of the excavation rendered the work difficult or unprofitable that the search for stone ceased.

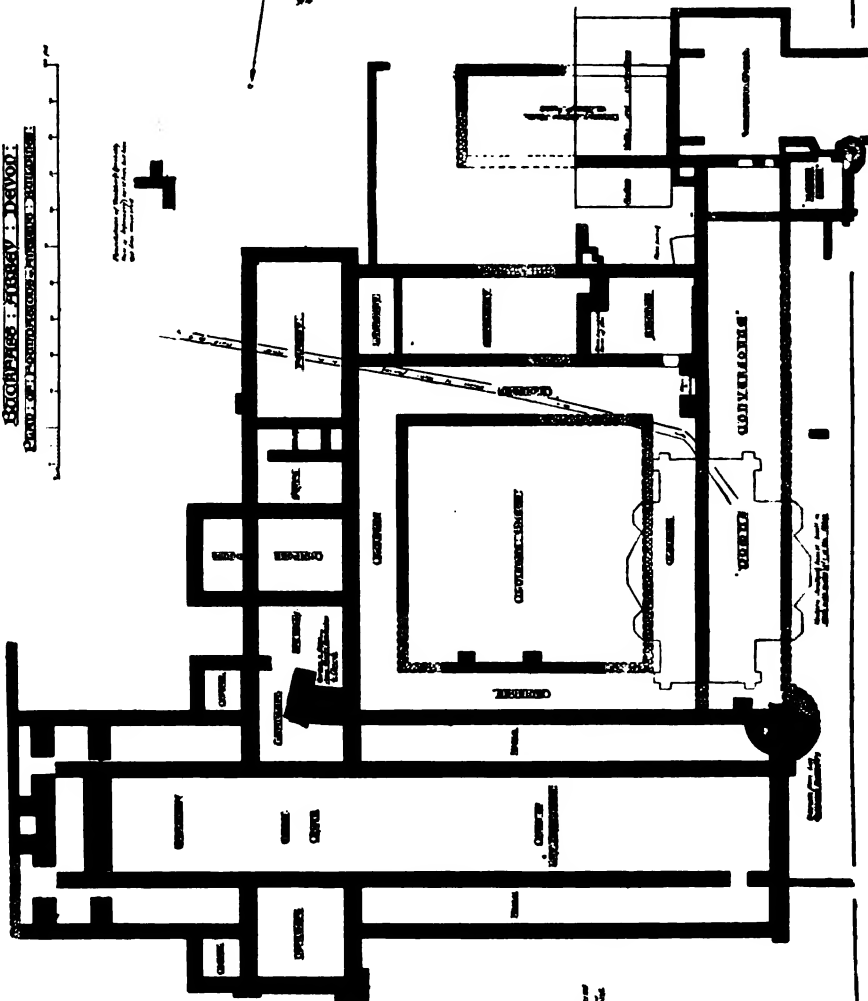
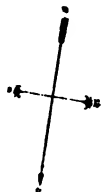
On the south are remains of other buildings, probably the Abbot's lodgings and the infirmary; but these, so far, have not been explored.

We have therefore, as I before suggested, at Buckfast, a normal Cistercian plan, and an opportunity is now presented such as may never occur again in our county of seeing the outline of the buildings of an important foundation of this Order. The history of the house carries us far back before the establishment of Cistercians, and therefore before the

SECTION 68 - FISHBAY - DEBOD
 PLAN OF THE FISHBAY DEBOD



Direction of North
 (as determined by compass)



Prof. A. Young
 Chief, Dept. of Fisheries
 Seattle, Wash.

Scale
 1 inch = 10 feet
 1/2 inch = 5 feet
 1/4 inch = 2 feet

plan of the buildings for their use was decided on; and yet we find here that in the alterations and rebuildings that must have from time to time taken place, the rules laid down for the construction of the buildings of the Order were never lost sight of, and eventually the whole was brought into harmony with the directions of the founder and his followers. The dimensions of the *domus conversorum* give an indication as to the number of lay brethren admitted to the Abbey. The largest building that I know of is at Fountains, three hundred feet long. Here the length is about one hundred and fifty feet, and of proportionate breadth; and we may assume, according to Mr. Sharpe's calculation, that this was intended to house one hundred men employed in the work of the monastery. Possessors of the land they held round and about the Abbey, fewer labourers than these would not be sufficient.

But few remains have been found during the excavations, some plain and colour-glazed tiles, a spoon or two, a quarry with the figure of a pelican, and a bulla of John XXII., being the most important.

To refer a little more in detail to the work of discovery, and mainly in the words of Father Hamilton. In the chapter-house portions of the step and stone bench running round the interior wall of the building have been found. These portions are at the eastern end, and are of red sandstone, but very much crumbled, as might be expected from long exposure and damp. The floor was found strewn with fragments, probably from various parts of the Abbey, pieces of small shafts, bits of carved stone, and statuary, often coloured, but all of late fifteenth century date, indicating that the chapter-house and many of the buildings were at that time renewed in the late perpendicular style, probably by Abbot Slade or Abbot Beagle.

The clearing away of the earth round the foundations of the tower, brought to light some fragments of Purbeck marble shafts and a small three-quarter base of a Norman pillar, with a bead ornament. Tiles of thirteenth century date, fragments of which have been found in other parts, were found here also. The walls of the tower show evidence of patching and alteration, and the remains around it make it clear that there was an earlier building here, and that the tower was restored in the fifteenth century. There was also evidently a porch in front of the tower entrance on the north.

The large irregular mass of masonry in the south transept has been found to be of great strength and solidity, and the mortar is so tenacious that two men, after an hour's labour,

succeeded in loosening one or two stones only. There can be little doubt but that it was the substantial foundation of the staircase leading from the monks' dormitory to the church, and used by them, as at Fountains and elsewhere, in going to the nocturnal services.

Further and careful search has not resulted in finding any trace of shafts, capitals, or bases of the columns of the arcade dividing the nave from the aisles; and Father Hamilton has come to the conclusion that there were none such, but that the piers were simply masonry ones. Beyond this he is also of opinion that the nave was separated from the aisles by a wall rising some height above the level of the pavement. This seems quite evident on the north side, which has been less deeply quarried, and the opening from nave into aisle is perfectly plain. In one place this division wall is standing some three feet high, and has still the original rough-cast upon it.

The massive foundations at the east end, which at first were supposed to be the site of the altars there, are only those of the eastern wall. This wall is united to a thin wall behind by stones set edgeways, apparently to keep down the water, and the massive east wall itself is rudely vaulted to allow the water to pass. Here fragments of freestone abound, and a small early English capital was found.

A series of levels recently taken shows that the buildings sloped down towards the river. The doorstep of the chamfered entrance to the kitchen is three inches below the ancient doorstep of the tower. The doorstep of the slype adjoining the chapter-house is one foot eight inches below the pavement of the kitchen. On the other hand, the lime-ash floor, if such it is, of the choir in the church, close to the site of the high altar, is six and a half inches above the tower step level.

The Duke of Norfolk has undertaken to restore the so-called Abbot's Tower, and well is it being done by his Grace. I may make a suggestion, that this building was the residence of the master of the conversi, it being in just the position for such a building. It is intended to rebuild the whole of the church and chapter-house, cloister, and the domestic buildings, upon the old foundations, and in, I believe, the Perpendicular style.

The plan accompanying this paper is a reduction of a large one made by Mr. Frederick A. Waters, and I am much indebted to him and to Father Hamilton for permission to make use of it.

THE BLACK ASSIZES IN THE WEST.

BY FREDERICK WILLCOCKS, M.D.

(Read at Newton Abbot, July, 1884.)

THE name of "Black Assizes" has been applied to several fatal epidemics of typhus or gaol fever which broke out at the County Assizes during the sixteenth and eighteenth centuries in various parts of the country, and proved fatal to many present in the courts at the time, including judges, counsel, magistrates, jurymen, and spectators. Of such outbreaks three are recorded to have taken place in the Western Counties; namely, at the Exeter, Taunton, and Launceston Assizes. The fever was brought into court by the prisoners on trial, and was supposed to have been engendered in the gaols themselves in consequence of their excessively overcrowded and generally unhealthy and dirty condition.

During the latter half of the last century, John Howard, the well-known philanthropist, who was a magistrate for the county of Bedford, personally visited most of the prisons in England and Wales, as well as those of several Continental States, and subsequently embodied his experiences in a work entitled, *The State of Prisons in England and Wales, &c.* The first edition of this work was published in 1777, the second in 1780, and the third in 1784.

He has there left us a frightful picture of the condition of English prisons in his day. The sanitary arrangements were of the worst possible description, and, besides this, the prisons themselves were subject to little or no supervision; in fact, as Howard states, the visiting justices were often deterred from inspecting the gaols under their control by the gaoler reporting that the fever was prevalent in the prison. The prisons were, moreover, greatly overcrowded, especially in times of peace, and not unfrequently acted as centres for the spread of infectious fever, which was carried to the surrounding districts by discharged prisoners, while recruits

drawn from the gaols spread it through the Army and Navy, and transported convicts carried it even to the American colonies. The gaol fever thus became, as Howard forcibly pointed out, "a national concern of no small importance."

As a consequence of his visits and representations he was examined before the House of Commons in March, 1774, and received the thanks of the House. Shortly afterwards a Bill for the better regulation of prisons and the prevention of gaol fever was introduced by Mr. Popham, the member for Taunton, a town in which a very serious outbreak of gaol fever had occurred at the Lent Assizes in 1730. This particular epidemic, to which reference will be made again later in the present paper, proved fatal to the Lord Chief Baron Pengelly, to the High Sheriff for Somersetshire, John Pigot, and to many others who were present in the court at the time.* By Popham's Bill, which was passed in due course, provision was made for the more efficient cleansing and ventilation of the prison wards, isolation wards for infectious fever cases were instituted, and medical officers appointed to the prisons to report on the health of the prisoners at each quarter sessions. Howard found, on his subsequent visits, that these regulations had produced a most marked improvement in the health of English gaols, and though occasional outbreaks of gaol fever occurred again later in the century, the danger of any further "Black Assizes" was completely removed.

Of the better known "Black Assizes" we have distinct records of six, which occurred respectively at † Cambridge in 1522, at ‡ Oxford in 1577, at § Exeter in 1586, at || Taunton in 1730, at ¶ Launceston in 1742, and at the ** Old Bailey in 1750.

* (a) *Gentleman's Magazine*, 1750, vol. xx. p. 235. (b) *State of Prisons, &c.*, John Howard, 2nd ed. 1780, p. 12. (c) *Observations de Aëre et Morbis Epidemicis*, John Huxham, M.D., F.R.S., 1752, vol. ii. p. 83.

† (a) *HALL'S Chronicle*, 1548, fol. lxxxxii. (b) *History and Antiquities of Oxford*, Anthony à Wood, 1796, vol. ii. p. 191. (c) *The Haven of Health*, Thomas Cogan, M.A., M.B., 1596, p. 318. (d) *Philosophical Transactions*, Ward, vol. i. 1758, p. 699.

‡ (a) *History and Antiquities of the University of Oxford*, 1796, vol. ii. p. 188, Anthony à Wood. (b) *Stow's Annals*, 1615, p. 681, Howes edit. (c) *BAKER'S Chronicle*, 1730, p. 353. (d) *HOLINSHED'S Chronicle*, Hooker, 1587, p. 1270.

§ (a) *HOLINSHED'S Chronicle*, 1587, Hooker, p. 1547. (b) *Stow's Annals*, 1615, Howes edit. p. 718.

|| *Gentleman's Magazine*, 1750, vol. xx. p. 235. *State of Prisons*, John Howard, 2nd ed. 1780, p. 12. *Observations de Aëre et Morbis Epidemicis*, John Huxham, vol. ii. p. 83.

¶ *Observations de Aëre et Morbis Epidemicis*, Huxham, vol. ii. p. 82.

** (a) *Gentleman's Magazine*, May, 1750, pp. 233, 235. (b) *Philosophical Transactions*, vol. xlviii. p. 42, Sir John Pringle, M.D., F.R.S. (c) *Observations on Diseases of the Army*, 5th ed., 1765, p. 330, &c., Sir John Pringle.

In the present paper I propose to consider the outbreaks which happened on the Western Circuit, at Exeter, Taunton, and Launceston, and these are the more interesting, as the records we have of them have been handed down by two Devonshire writers living at the time of the events which they respectively describe. These writers were John Hooker, Chamberlain of Exeter, and Dr. John Huxham, F.R.S., a physician of Plymouth. The account which I have inserted here of the outbreak at Exeter in 1586 is extracted from the edition of Holinshed's *Chronicle*, published in 1587. This work was continued by John Hooker down to the year 1586, and it is to his hand that we are indebted for the very graphic and detailed description of the Exeter "Black Assizes." John Hooker was, according to Prince (*Worthies of Devon*, ed. 1701, p. 387), born in Exeter in 1524, and elected Chamberlain of the city in 1555. He lived until the year 1601, and was buried in the Cathedral at Exeter; and from intrinsic and other evidence it would appear highly probable that he was himself an eye-witness of the scenes which he narrates. The account in Holinshed, entitled in the margin, "the note of John Hooker, *alias* Vowell, concerning the sudden and strange sicknesse of late happening in Excester," is here given at length in his own quaint and striking language.*

"At the Assises kept at the citie of Excester, the fourteenth daie of March in the eight and twentieth yeare of hir Majesties reigne before Sir Edmund Anderson knight lord chiefe justice of the common pless, and sargeant Floredaie† one of the barons of the exchequer justices of the Assises in the countie of Deuon, and Exon; first amongst the prisoners of the gaole and castell of Exon, and then dispersed (upon their trial) amongst sundrie other persons; which was not much unlike to the sicknesse that of late years happened at an assise holden at Oxford before Sir Robert Bell knight, lord chiefe baron of the exchequer, and justice then of that assise, and of which sicknesse he amongst others died. This sicknesse was verie sharpe for the time, and few escaped which at the first were infected therewith. It was contagious and infectious, but not so violent as commonlie the pestilence is, neither doth there appear any outward ulcer or sore.

"The origen and cause thereof diverse men are of diverse judgements. Some did impute it, and were of the mind, that it

* HOLINSHED'S *Chronicle*, 1587, vol. iii. pp. 1547-8. Mr. Robert Dymond, F.S.A., has kindly supplied me with a copy of the entry in Hooker's original manuscript, now preserved in the Guildhall at Exeter. This entry will be found in the Appendix, *infra*.

† Created a Baron of the Exchequer, October, 1585. *Calendar of State Papers*, Domestic Series. Eliz. 1581-90.

proceeded from the contagion of the gaole, which by reason of the close aire and filthie stinke, the prisoners newlie come out of a fresh aire into the same, are in short time for the most part infected therewith; and this is commonlie called the gaole sicknesse and manie die thereof. Some did impute it to certeine poore Portingals then prisoners in the said gaole. For not long before one Barnard Drake Esquier (afterwards dubbed knight) had bene at the seas, and meeting with certeine Portingals come from Newfoundland, and laden with fish, he tooke them as a good prize, and brought them into Dartmouth Hauen in England and from thense they were sent, being in number about eight and thirtie persons into the gaole of the Castell of Exon, and there were cast into the deepe pit and stinking dungeon.

"These men had been before a long time at the seas, and had no change of apparell nor laine in bed, and now lieng upon the ground without succor or reliefe were soone infected; and all for the most part were sicke and some of them died, and some one of them was distracted: and this sicknesse verie soone after dispersed it selfe among all the residue of the prisoners in the gaole, of which disease manie of them died, but all brought into great extremities, and verie hardlie escaped. These men, when they were to be brought before the foresaid justices for their triall, manie of them were so weak and sicke that they were not able to go nor stand, but were carried from the gaole to the place of judgement, some upon handbarrowes and some betweene men leading them, and so brought to the place of justice.

"The sight of these mens miserable and pitifull cases being thought (and more like) to be hunger starved than with sicknesse diseased moued manie a mans hart to behold and looke upon them, but none pitied them more than the lords justices themselves, and especiallie the lord chiefe justice himselfe, who upon this occasion tooke a better order for keeping all prisoners thenseforth in the gaole and for the more often trials: which was now appointed to be quarterlie kept at euerie quarter sessions, and not to be passed anie more over, as in times past until the assizes. These prisoners thus brought from out the gaole to the judgement place, after that they had been staid, and paused a while in the open aire, and somewhat refreshed therewith, they were brought into the house in the one end of the hall neere to the judges seat, and which is the ordinarie and accustomed place where they doo stand to their trialls and arraignmentes.

"And howsoever the matter fell out, and by what occasion it happened, an infection followed upon manie and a great number of such as were there in the court, and especiallie upon such as were nearest to them were soonest infected, and albeit the infection was not then perceiued because euerie man departed (as he thought) in as good health as he came thither; yet the same by little and little so crept into such as upon whom the infection was seizoned, that

after a few daies, and at their home comming to their owne houses, they felt the violence of this pestilent sicknesse: wherein more died that were infected, than escaped. And besides the prisoners, manie there were of good account, or of all other degrees which died thereof: as by name Sargeant Floredaie who then was the judge of those trials upon the prisoners, Sir John Chichester, Sir Arthur Bassett, Sir Barnard Drake, knights; Thomas Carew of Haccombe, Robert Carie of Clovelleigh, John Fortescue of Wood, John Waldron of Bradfeeld and Thomas Risdone Esquiers and justices of the peace.

"The losse of euerie of them was verie great to the commonwealth of that prouince and countrie, but none more lamented than these two knights Sir John Chichester, and Sir Arthur Bassett, who albeit they were but yoong in yeares yet ancient in wisdome, upright in judgement and zealous in the ministration of justice. Likewise Robert Carie a gentleman stricken in yeares, and a man of great experience, knowledge and learning; he had beene a student of the common lawes of the realme at the temple, and verie well learned both therein and uniuersallie seene in all good letters: an eloquent man of his speech, effectual in deliuerie, deepe in judgement, upright in justice, and considerat in all his dooings. The more worthy were personages, the greater losse was their deaths to the whole commonwealth of that countrie. Of the plebeian and common people died verie manie, and especiallie constables, reeues and tithing men, and such as were jurors, and namelie one jurie of twelve, of which there died eleyen.

"This sicknesse was dispersed through out all the whole shire, and at the writing hereof in the fine of October one thousand five hundred fourscore and six it is not altogether extinguished. It resteth for the most part about fourteene daies and upwards by a secret infection before it breake out into his force and violence. At the first comming it made the people afraid and dismaid, manie men then pretending rather than performing the amendment of life. So long as the plague was hot and feruent, so long euerie man was holy and repentant: but with the slaking of the one followed the forgetfulnesse of the other, euen as it is with a company of shrewd children who so long as the rod is over the head, so long feare of correction frameth to aptnesse, conformitie and obedience."

This account, judging from the minuteness of the details, would certainly appear to have been written by an eye-witness of the scenes described; and as Hooker states that he is writing "in the fine of October one thousand five hundred fourscore and six," and the *Chronicle* was published in the next year, this note must have been one of the latest additions made to it by his hand. A somewhat similar, but shorter,

account is given by Stow in his *Annals*.* Lord Bacon also was evidently well acquainted with the "Black Assizes" of his time at Oxford and Exeter, and refers to them in the following words in his *Natural History*:† "The most pernicious infection next the plague is the smell of the jail when the prisoners have been long and close and nastily kept; whereof we have had, in our time, experience twice or thrice, when both the judges that sat upon the jail, and numbers of those who attended the business, or were present, sickened and died. Therefore it were good wisdom that in such cases the jails were aired before they be brought forth." It is worthy of note that both Bacon and Hooker draw a distinction between the gaol fever and the true plague, for Bacon calls the former the most pernicious infection *next the plague*, while Hooker says that it is "not so violent as commonlie the pestilence is, neither doth there appear any outward ulcer or sore." Cogan‡ speaks of the gaol fever at the Oxford Assizes in 1577 as being a "neere cosin to the plague," and as "strange and unknowne to the most part of physicians;" but from his own account and that of other writers, there can be little doubt that the gaol distemper of the sixteenth century was really typhus fever, and differed in no respect from the various "Black Assizes" of the eighteenth century, which were undoubtedly outbreaks of typhus.

The majority of Devonshire historians are remarkably silent with regard to this Exeter outbreak. There is no mention made of it either by Westcote, Lysons, or Pole, while Polwhele§ only briefly refers to it in the analysis of contents prefixed to his first volume, and gives no further details whatever concerning it. Richard Izacke, in his *Antiquities of the City of Exeter*,|| places the Exeter outbreak in the year 1585 (27th Eliz.) i.e. one year earlier than the date given by Hooker. In other respects he practically follows Hooker's account, but calls the judge of the Assizes Serjeant Flowerdby, and omits from the list of justices to whom the fever proved fatal the names of Thomas Carew, of Hacombe, John Fortescue, of Wood, and Thomas Waldron, of Bradfield. Prince,¶ in his "Life of Sir Bernard Drake," takes his account

* Stow's *Annals* (Howes edition), 1615, p. 718. See also *Leycester Correspondence* of 1585 and 1586, p. 224; and *Diary of Philip Wyot* (Town Clerk of Barnstaple, 1586-1608), appended to Mr. J. R. Chauter's "Literary History of Barnstaple," p. 90.

† Bacon's *Works* (Ellis and Spedding), vol. ii. p. 646. Exp. 914.

‡ *The Haven of Health*, Thomas Cogan, p. 318.

§ POLWHELE'S *History of Devon*, 1797, p. 10.

|| Page 137, ed. 1677.

¶ *Worthies of Deron*, p. 387, ed. 1701.

from Izacke, and consequently gives a still more meagre version of Hooker's story. He calls the judge Serjeant Flowerby, and only mentions the deaths of Sir John Chichester, Sir Arthur Bassett, and Sir Bernard Drake among the justices present in the court. Canon Kingsley, in *Westward Ho!** represents one of his characters, John Braund of Lundy, as dying of gaol fever in Exeter gaol, "made infamous," he says, "but two years after (if I recollect right) by a 'Black Assizes,' nearly as fatal as that more notorious one at Oxford, for in it (whether by the stench of the prisoners, or by a stream of foul air) judge, jury, counsel, and bystanders, numbering among them many of the best families in Devon, sickened in court, and died miserably within a few days."

During the seventeenth century the outbreaks of true plague threw all other epidemics into the shade, and there is only one questionable "Black Assizes" recorded, namely, at Thetford† (March 10th, 1666), when the sheriff of Norfolk, his chaplain, and many of his retinue, were attacked with some unknown complaint, and died suddenly. In the eighteenth century typhus fever was again very prevalent in gaols, and two serious "Black Assizes" occurred on the Western Circuit in the earlier half of the century, namely, at Taunton in 1730, and at Launceston in 1742. An account of these has been preserved in the writings of Dr. Huxham, of Plymouth. This eminent physician made a continuous series of observations on the meteorology and health of Plymouth and its neighbourhood for upwards of twenty years, from 1728 to 1748, and subsequently published them in a Latin treatise‡ in 1752, together with his celebrated essay on the *Devonshire Colic*. Writing in April, 1742, he refers to the outbreak at Launceston Assizes in the following words:

"Febris putrida contagiosa, ac pestifera valde, cum ingente virium damno, maxima prae cordiorum oppressione, tremore tendinumque subsultu, vigiliis, delirio, lingua nigrâ, ac sæpe aridâ valde, faucibus squalidis et halitu foetidissimo, jam apud Launceston ejusque viciniam saevit admodum, estque profecto funesta maxime."

Then follows a very clear description of the fever, which was obviously typhus, and he proceeds to give his views on

* Chap. xv.

† "Some say the sudden death of the sheriff of Norfolk, his chaplain, and others of his retinue at the assizes held at Thetford, 10th March, 1666, was the same disease with this we are now speaking of, yet the generality of people, as I remember, then said it was occasioned by drinking of bad wine." — *History and Antiquities of the University of Oxford*, Anthony à Wood, 1674, p. 191, Gutch's edition.

‡ *Observationes de Aëre et Morbis Epidemicis*, vol. ii. p. 82.

its mode of production in prisons, and its dissemination by means of the county assizes, incidentally referring to the "Black Assizes" at Oxford in 1577, and at Taunton in 1730:*

"Genita haec in carceribus febris, et per comitia provincialia disseminata longe, lateque, plurimos letho dedit, optimaque saepe elusit consilia. . . . Cui ignota sunt comitia Oxoniensia, 1577, atque nupera apud Taunton, anno 1730, ubi pestifera mephitis tot tantisque viris mox fuit exitio? Perfrequens est utique generatio febris pestilentis in angustis, immundisque carceribus; etiam ipse aer conclusus in fodinis, speluncis, puteis, tandem evadit exitialis admodum, idque longe citius si accedunt quoque plurima animalium effluvia quae et ipsa porro magis magisque in horas virulenta fiunt, brevique pestifera maxime."

He finishes his reflections with the following very sensible advice:

"Purgandus est ergo frequenter, ventilandus, corruptus carcerum, navigiorum, ac nosocomiorum aer, ubi plurimi congesti sunt homines, ne longiore morâ fiat pestiferus."

From these passages it would appear that Huxham, though well acquainted with the Oxford and Taunton "Black Assizes," was not aware of the Exeter outbreak of 1586, although it had been briefly referred to both by Izacke and Prince shortly before his time.

Another account of the Taunton "Black Assizes" of 1730 is to be found in the *Gentleman's Magazine* for 1750,* where it is stated that the Lord Chief Baron Pengelly, with several of his officers and servants, and Sir James Sheppard, Knight, Serjeant-at-Law, died at Blandford, in Dorsetshire on the Western Circuit, during the Lent Assizes, as well as John Pigot, High Sheriff of Somersetshire. The infection was supposed to have proceeded from some prisoners brought from Ilchester gaol to take their trial at the Taunton Assizes, and the fever subsequently spread through the latter town, and carried off some hundreds of persons.

Subsequent to the Launceston "Black Assizes" in 1742, no further outbreak in a court of law is recorded to have taken place in Devon, or elsewhere in the West; but there is evidence, in Howard's writings, to show that gaol fever was more or less prevalent in our Western prisons down to a comparatively late period of the last century. He tells us,

* *Observationes de Aëre et Morbis Epidemicis*, vol. ii. p. 83.

† Vol. xx. p. 235.

for example, that in 1755 many persons died at Axminster* of gaol fever, brought from Exeter gaol by a discharged prisoner. Again, he also records outbreaks in the bridewells of Shepton Mallet,† Taunton,‡ and Bodmin;§ and in his visit to the Launceston|| County Gaol, in 1774, Howard found the keeper, assistant, and all the prisoners but one ill of gaol fever, and mentions that a few years before many had died there. Two years later he reports that the surgeon and two or three prisoners had died of gaol fever in the Exeter County Bridewell,¶ and, on a later visit to the Exeter High Gaol in 1787,** he states that the gaoler had died from the same fever.

These instances are sufficient to show that imminent danger of a further series of "Black Assizes" still continued to exist, and that the gaol fever was not completely stamped out of our prisons by improved hygienic regulations until a comparatively recent period. In visiting a prison at the present day, however, one cannot fail to be struck with the order, cleanliness, and excellent sanitation both of building and inmates; in these respects presenting a marked contrast to the state of things which prevailed in the time of Hooker and Huxham. In our days an outbreak of the so-called gaol fever in an English gaol is, so far as I am aware, unknown, and, it is to be hoped, well-nigh impossible.

I have ventured to bring the subject of this paper before the Association, not only from the interest it possesses as bearing on the history of public health in Devon, but also from a desire to draw greater attention to the excellent records of Hooker and Huxham, which seem to have been overlooked or but lightly regarded by the various writers of our county histories.

APPENDIX.

"M^d that the Assisses kepte yn the castle of Exceter in the lent there were sondrye prisoners areigned before Sergeant flowerdaye and sodonlye there came suche a glome at the barre that a great number of the people there beinge were infected and whereof there dyed in very shorte tyme the saide M^r flowerday S^r Plp Chichester S^r Arthur Bassett S^r barnard Drake Knightes Robert Carye & Thom^s Risdonne Esquiers Justyas of peace and of a

* "General View of Distress in Prisons," *State of Prisons in England and Wales*, John Howard, 2nd ed., 1780.

† *Ib.* p. 358.

‡ *Ib.* p. 357.

§ *Ib.* p. 352.

|| *Ib.* p. 351.

¶ *Ib.* p. 348.

** *An Account of the Principal Lazarettos in Europe, &c.*, 1789, p. 185.

Jurie who was to make there a tryall upon one of the prysoners at the barr there dyed a xj of them and only one man of the xij escaped The cause of this syckness was saide to be this. S^r barnard Drake having bene at the seas toke a porrignal ship who had benne long at seas and the merchants and maryners were all worne out p^rtly wth sycknes and partly thro want of victualls & necessaries. These men wth their ship he brought yn to Dartmouth hauen and caused them all to be sent to the Gaole of Exceter Castle where they infected the whole Gaole wth syckness and they all for the most p^rte dyed thereof and enfectod also both Citie & Countrie & which sickness contynewed a longe tyme."

(*Extract from the Manuscript of John Hooker, in Guildhall, Exeter.* This is the original note made by John Hooker at the time of the Exeter outbreak, and forms the basis of his more detailed account in Holinshed's *Chronicle* (1587) which is quoted at length in the text.)

NOTES ON SLIPS CONNECTED WITH DEVONSHIRE.

PART VII.

BY W. PENGELLY, F.R.S., F.G.S., ETC.

(Read at Newton Abbot, July 31st, 1884.)

THE *Slips* mentioned in the succeeding pages have been noted by me since our last Annual Meeting, and, it is believed, require no further Preface.

I. BUDGELL: *The Date and Place of Birth of Mr. Eustace.*

In my *Notes on Slips Connected with Devonshire, Part VI.* (*Trans. Devon. Assoc.* xv. 211-230, 1883), mention is twice made of Mr. Eustace Budgell as "a native of St. Thomas, Exeter." (pp. 222, 223.) Mr. R. Dymond, F.S.A., of Exeter, writing me on this repeated statement, on 6th November 1883, said, "There is reason to believe that the accident of his" [Mr. E. Budgell's] "birth occurred at Simondsbury in 1686, his father, the Rev. Gilbert Budgell, having been presented to the rectory of that parish two years before."

I could only reply that while I had never previously heard a doubt on the subject, I had not trusted entirely to current belief, but had consulted sundry works, in which I placed some confidence; that the *Penny Cyclopædia* stated that Eustace Budgell was the "son of the Rev. Gilbert Budgell; was born about 1685, at St. Thomas, near Exeter;" and that "his mother was Mary Gulston, daughter of a Bishop of Bristol (v. 533, 1836); that according to the *Encyclopædia Britannica*, he "was the son of Gilbert Budgell, D.D., and was born at St. Thomas, near Exeter, 1685" (8th ed. 1854, v. 725); and, finally, that an eight-volume edition of the *Spectator*, without date or editor's name, but evidently printed after 1763, contained *Sketches of the Lives of the*

Authors (I. i.-xvi.), in which it was stated of *Mr. Eustace Budgell*, "This gentleman was born near Exeter in 1685; his father was Gilbert Budgell, Doctor of Divinity." (p. vii.)

It may be remarked that at least three statements respecting Eustace Budgell, had preceded mine in our *Transactions*.

Thus, Mr. J. R. Chanter, in his *Early Poetry of Devonshire*, has "EUSTACE BUDGELL, 1685-1736. This notorious author, descended of an ancient Devon family, was born at St. Thomas, Exeter." (vi. 542.)

Again, in the *First Report of the Committee on Devonshire Celebrities*, we have "Budgell, Eustace: writer: b. 1685, d. 1736. *Trans. Devon. Assoc.* vol. vi. 542. J. R. Chanter." (ix. 106.)

Finally, Mr. R. Dymond, speaking of a Mr. Budgell, to whom, in 1649, a payment had been made by the Churchwarden of the Parish of St. Petrock, Exeter, says, "Mr. Budgell was probably an ancestor of Eustace Budgell (born 1684, died 1737), an able and ingenious writer, and an author of papers in the *Spectator*, who lived in St. Thomas." (xiv. 473.)

The following are the only other works containing mention of the date, or place, or both, of Eustace Budgell's birth, which I have been able to consult.

Ency. Brit., 3rd ed. 1797. St. Thomas near Exeter, about 1685.

Eng. Ency., 1802. St. Thomas near Exeter, about 1685.

Ency. Brit., 5th ed. 1815. St. Thomas near Exeter about 1685.

Rees's Cyclo., 1819. St. Thomas near Exeter, 1685.

Phillips's Dict. of Biog. Ref., 1871. About 1685.

Ency. Brit., 9th ed. 1876. St. Thomas near Exeter, 1685.

Athenæum, 12th April, 1884. About 1685.

It will be observed that of the 14 statements mentioned above, 10 name "St. Thomas" as the birthplace; 1 is content to say "near Exeter;" and the remaining 3 are silent. 6 state the year of birth to have been "about 1685;" 6, that it was "1685;" 1, that it was "1684;" and the remaining 1 is silent. While the only one mentioning the mother's maiden name, says it was "Mary Gulston."

Let us now see how the Baptismal Register agrees with the foregoing statements.

In March 1884, I sent the Rector of Symondsbury, near Bridport, Dorset, a statement of the case, and requested him, that if his Parish Register contained any record of the birth

or baptism of Eustace Budgell, to be so good as to favour me with a copy of the entry. The return post brought me the following in reply :

"1686 Eustace son of Gilbert Budgell, A.M. Rector and Ann his wife born Aug. 19, bapt^d Sept. 2."

"I hereby certify that the above is a true copy of the entry in the Register Books of the parish of Symondsbury, made this 21st March 1884.

(Signed) "FREDK. W. MANSELL,
"Rector of Symondsbury."

Mr. Mannsell adds: "Gilbert Budgell, D.D., was of St. Thomas, near Exeter. He married Ann, daughter of Bishop Gulston, who held this Benefice in commendam, and on the death of his Father in law, Budgell was instituted 20th Sept. 1684.

"Even in railway times a child could hardly be born at Exeter Aug. 19, & bapt^d at Symondsbury Sept. 2."

We can now apparently state with safety that Eustace Budgell was

1. Not born at "St. Thomas," nor elsewhere near Exeter, nor anywhere in Devonshire; but at Symondsbury near Bridport in Dorsetshire.

2. That he was not born in "1684" or "1685," but on 19th August 1686.

3. That his mother's maiden name was not "Mary Gulston," but Ann Gulston, daughter of William Gulston, D.D., Bishop of Bristol from 1679 to his death in 1684.

Mr. Eustace Budgell is neither entitled to the place he occupies in the *First Report* of our *Committee on Devonshire Celebrities* (*Trans. Devon. Assoc.* ix. 106), nor to a niche in Mr. Chanter's *Calendar of Devonian Poets* (*Ibid.* vi. 542); but it will probably be difficult now to dislodge him from either.

As long ago as 1797 he took place, perhaps not for the first time, in the *Encyclopædia Britannica*, as a native of St. Thomas, Exeter; he holds the same place in the 9th edition (1876) of that great work; and I feel by no means sure that he will be ousted when the 10th edition is published.

In an early part of this Note mention was made of an edition of the *Spectator*, without date or editor's name, which contained *Sketches of the Lives of the Authors*. (See p. 606 above.) The following is one of the "Sketches":

"MR. GILBERT BUDGELL. We know nothing of this gentleman but that he was the brother of Mr. Eustace

Budgell, and who is said to have contributed his aid to a few papers in the eighth volume." (I. xv.)

On mentioning the foregoing statement to the Rector of Symondsbury, he was so good as to send me, on 25th March 1884, the following compilation from his Parish Registers :

Born

"Gilbert	Feb. 12, 1688
William	March 18, 1689
Seymour	March 5, 1691

besides three daughters of Gilbert & Ann Budgell were born & bapt^d here."

Devonshire is too rich in distinguished sons to be under any temptation to appropriate those belonging to other counties. It should be remembered too that a misappropriated one may be the only celebrated native of some country village.

Thus, the Rev. Mr. F. W. Mannsell, writing me on 21st March, 1884, said : "Eustace Budgell is absolutely the only man of any eminence who has been in any way connected with this parish" [Symondsbury] "from the days of your friends of the caves to the present time."

Devonshire will require all her watchfulness to preserve herself from being unintentionally and unknowingly a receiver of stolen goods. Not many years ago it was stated in a local paper that Bishop Colenso was a native of Devon ; and in the *Academy* for 1st March, 1884 (xxv. 155), an unsigned article, entitled "*Art in Devonshire*, by George Pycroft (Exeter)," contained the following statement : "Mr. Pycroft certainly (perhaps very naturally) does more justice to Exeter, his native town, than he does to a yet more active centre, Plymouth."

The writer is, of course, under the belief that Mr. Pycroft is an Exonian, and his words will of necessity lead all who have no better means of information to the same conclusion. Nevertheless, Mr. Pycroft, instead of being an Exonian, or even a Devonian, was born near Corsham, in Wiltshire.

II. DEVONSHIRE: *The "Century Magazine" on.*

The *Century Magazine* for December 1883, contains an Article entitled *The fairest County in England*, meaning Devonshire (xxvii. 163-174). It is written in an attractive style, and enriched with nine beautiful illustrations, but is by no means perfect. The grand coast between the Start

Point and Plymouth Sound is utterly ignored; so little care has been expended in correcting the press as to leave *Farmington* for *Fremington* (p. 165), *Boggy* Point for *Baggy* Point (p. 171), the Vale of *Berkleigh* for the Vale of *Bickleigh* (p. 172), and *Tingle* Bridge for *Fingle* Bridge; and there are many Slips in matters of fact. The object in the present Note is to point out some of these Slips, reserving those of a geological character to be dealt with elsewhere. The passages containing them will be quoted, and comments offered on them, in the order in which they occur in the Article.

1. *The Size of Devonshire.*

"In the matter of size it" [Devonshire] "stands second upon the list of English counties, including an area of 2654 square miles." (p. 163.)

In 1883 I called attention to the prevalent belief that Devonshire was, as the *Century* says, in the matter of size, "second upon the list of English counties;" and I pointed out that instead of being second; it was really the third—Yorkshire being the first, and Lincolnshire the second.

At the same time, I remarked "If the Registrar General's figures are trustworthy, the area of Devonshire is 1,621,746 statute acres" (*Trans. Devon. Assoc.* xv. 230). Reducing the acres to square miles, the area of this county is 2534 square miles, instead of 2654, as the *Century* states. In other words, the *Century's* statement is 120 square miles, that is 4·7 per cent., above the truth.

2. *Exeter Cathedral.*

"The erection of the existing cathedral building was not commenced until the year 1112. Bishop William Warlewast was its originator, and it received successive additions by subsequent bishops of Exeter during no less than seven reigns, being completed by Bishop Bothe, in the year 1478 and in the reign of Edward the Fourth." (p. 164.)

The ordinary reader would, no doubt, be led by the foregoing quotation to *skip* into the belief that Warlewast's cathedral was still essentially intact, but had been added to from time to time. The actual facts, however, will probably be more accurately set forth by the following extracts from the gifted pen of the late Mr. R. J. King, whose competency as the historian of the cathedral no one will question. In

the 8th ed. (1872) of *Murray's Handbook for Travellers in Devon and Cornwall*, he says "A new cathedral was commenced by Bp. Warlewast . . . (1107-1136), and was completed by Bp. Marshall (1194-1206). In 1136 it was much injured by fire, during Stephen's siege of the Castle. The portions which remain of this *Norman* building are the transeptal towers, and perhaps some courses of masonry on the N. side of the nave between the N. tower and the N. porch. . . . Bp. Walter Brounecombe (1258-1280) commenced a series of new works, which led to the gradual removal of the *Norman* Cathedral and to the erection of the present structure. Part of the Lady chapel was built during his time; but his successor, *Peter Quivil* (1280-1291), seems to have furnished plans for the entire building, which were followed with but little variation by his successors. Bp. Quivil himself constructed (or completed the construction of) the transepts out of Warlewast's *Norm.* towers and completed the Lady chapel. Bp. Bytton (1292-1307) began the work of the choir and completed the 3 western bays. His successor, Bp. Stapledon (1307-1326), constructed the remaining 4 bays. Bp. Grandisson (1327-1369) completed the nave. Bp. Brantyngham (1369-1394) probably added the western screen, with its porches and sculpture." (pp. 13-14.) . . . "The *episcopal throne* . . . was no doubt the work of Bp. Stapledon . . . though it has been generally assigned to Bp. Bothe—more than a century later." (p. 21.)

3. *Plymouth Breakwater.*

"In the month of April, 1812, a huge block of stone was cast into the sea, about the center of Plymouth Sound, where the water was fifty feet deep. Other blocks followed, day after day, and week after week; and, though two hundred men were employed upon the work, a year passed without any visible result. Sixteen thousand tons of stone had been swallowed up, and still the waters closed over and hid from view the enormous mass of granite. Persistently, however, the work was carried on, and after a while its fruit began to be manifest, for, here and there in places, points of stone began to peep up among the waves. For thirty-four years the work proceeded, during which time no less than four millions of tons of granite had been cast into the sound. Then upon this vast substructure, varying in depth from forty to eighty feet, according to the variations in the sea-bottom, and in width, at its base, from three hundred to four hundred feet,—in length about a mile,—a stone terrace was

constructed, the most elevated platform of stone being but two feet above the level of the highest spring tides." (p. 165.)

Many of the statements made, explicitly or implicitly, in the foregoing quotation, differ considerably from those on the same topics made elsewhere, as will be seen by comparing the statements, compiled from the *Century Magazine*, in the left column below, with those opposite them in the right column, compiled from the *Encyclopædia Britannica* (8th ed. 1854, v.), *Murray's Handbook for Devonshire* (9th ed. 1879), and *White's Directory of Devonshire* (2nd ed. 1878-9).

The first stone was deposited in April 1812.

200 men were employed upon the work.

A year passed after the first stone was deposited without any visible result.

16,000 tons of stone were deposited during the first year of the work, i.e. before the work became visible.

The breakwater was built of granite.

The breakwater contained 4 millions of tons of granite.

The first stone was deposited on 12th August 1812. (*Ency.* 309.)

205 men, in the pay of the government, and 470 in the pay of the contractors, a total of 675, were employed upon the work. (*Ency.* 310.)

The work became visible at spring-tide low water on 31st March 1813, i.e. at the end of 7 months 19 days. (*Ency.* 309.)

16,045 tons of stone were deposited between 12th August and 31st December 1812, i.e. during 4 months 19 days (*Ency.* 309); and 43,789 tons had been deposited when the work became visible, i.e. during 7 months 19 days. (*Murray*).

The breakwater was built essentially of limestone quarried at Oreston, near Plymouth; and it was finally paved and faced with granite.

In June, 1847, there had been deposited 3,620,440 tons of limestone, and it was estimated that 50,000 tons more would complete the work. 2,512,696 cubic feet (= 186,720 tons) of granite and other stone were used in the pavings and facings, giving a total of 3,857,160 tons, of which upward of 95 per cent. was limestone.

4. *Dartmoor Forest.*

"The designation of 'Forest,' which still attaches to Dartmoor, though now in a general way inapplicable to this remarkable table-land on account of the entire absence of trees from many parts of it, was, no doubt, peculiarly appropriate in ancient times, when a vast extent of this moorland must have been covered by a dense forest growth. In the gloomy depths of this primeval forest the Druids found ample opportunity for the exercise of their solemn, mysterious, and fearful rites; and hence the reason for the existence of so large a number of cromlechs, circles, and altars. The oak, too, in whose groves the most cruel and dreadful of the Druidical rites were performed, no doubt flourished luxuriantly during the Druidical period." (p. 167.)

The word "Forest," applied to Dartmoor, has not unnaturally led many, before the *Century*, into the belief that "in ancient times . . . a vast extent of this moorland must have been covered by a dense forest;" nevertheless the word does not necessitate this belief.

One of its definitions is, no doubt, "a large tract of land covered with trees;" but another is "a royal hunting ground."

Those whose studies and opportunities entitle them to be heard with deference on this question are by no means ardent supporters of the belief now under notice. Thus, the late Dr. Edward Moore, F.L.S., of Plymouth, in his *Botany of Dartmoor*, appended to the Rev. Samuel Rowe's well known *Perambulation*, says "The term 'Forest,' applied to great part of it" [Dartmoor], "may lead to the inference that, in earlier ages, it might have been dotted with trees and shrubs; indeed trunks of tolerably-sized trees have been occasionally found in the bogs, the roots of one of which, indicating a considerably advanced growth, is now in the Museum of the Plymouth Institution. Still, after all, the appellation may only mean to be used in the loose sense of a Forest, or Chase, fit for the resort of game, and the recreation of the nobility of feudal times." (*Perambulation*, ed. 1856, p. 267.)

Again, the late Mr. Pitman Jones, a well-known antiquary who resided at Exeter, says in an Appendix on *Historical Documents*, included also in the *Perambulation*, "It has been justly observed that the technical meaning of the term *Forest* does not necessarily imply that there should be more timber or herbage than may be sufficient to supply food and shelter for the wild animals which range over it. It is indeed possible that there

formerly existed more wood on Dartmoor than is now to be found, and that the tanners, who were certainly allowed to supply themselves with fuel for the fusion of the ore, have laid waste the surface; but it is more probable that the granitic table-land of the Forest was never covered with anything entitled to the name of timber, and that it was reserved as a mere hunting ground." (*Ibid.* p. 308.)

"We know," continues Mr. Jones, "that the princely owners of Dartmoor have always provided for the contingency of their personal presence in the field. Lymstone manor was held by the tenure of furnishing two arrows and an oaten loaf to the Lord of Lidford, when he came to hunt on Dartmoor. The Lord of Kingdon, Shiredon, and Hockneton, was bound to present three arrows on like occasion; and the Lord of Druscombe held his land by the serjeanty of bearing a bow and three arrows to the King's use when he hunted on Dartmoor. These tenures are set forth in the Hundred Rolls, and the Record of the Knights' Fees in the Exchequer." (*Ibid.* 309.)

Whether the non-existence of a primeval forest with "gloomy depths" would prevent the Druids from exercising "their solemn, mysterious, and fearful rites" on Dartmoor I must leave the author to decide.

5. *Venomous Reptiles in Devonshire.*

"These trees" [of Wistman's Wood] "grow from between huge granitic masses, and in the hollows beneath lie adders and other venomous reptiles." (p. 168.)

It is impossible to say to what "other venomous reptiles" the author refers, inasmuch as, according to our best naturalists, the Adder is the *only* British venomous reptile. It is true that the Common Toad is, in the popular belief, credited with being venomous; but this is utterly discountenanced by naturalists. The worst that can be said of it is that the glandular tubercles of its skin can give out an acrid secretion when required for defence, for which it is evidently intended.

6. *Devonshire Rivers and Watering Places.*

"Into the waters of the English Channel, from this southern sea-border, flow the Axe, the Otter, and the Sid, the Exe and Teign, the Dart, Plym, and Tamar, by the charming watering-places of Seaton and Sidmouth, of Exmouth, Dawlish, and Teignmouth, and of Dartmouth and Plymouth." (p. 171.)

The author intended apparently to name the rivers in due order from east to west, as he begins with the Axe—the most easterly, and ends with the Tamar—the most westerly. He has slipped, however, in placing the Otter east of the Sid; but has correctly placed all the others.

He has failed to mention the Avon, the Erme, and the Yealm—the former two flowing into Bigbury Bay, and the last between that Bay and Plymouth Sound. They are at least as useful commercially as the Axe, the Sid, or the Otter; and yield to none in the county in their picturesqueness.

When it is remembered that the Plym and the Tamar flow into Plymouth Sound, it will be seen that, omitting that town and its rivers, he names as many rivers as towns; and it can scarcely be doubted that a stranger would slip into the belief that each of the rivers flowed by one of the towns named. The author seems to have forgotten that Budleigh Salterton is at the mouth of the Otter, and that there is no other “charming watering-place” by which that stream flows; while no river he mentions flows by Dawlish.

7. *The vertical and horizontal Extension of Dartmoor.*

“Dartmoor itself occupies an extensive area. It is some twenty-two miles long by about nineteen in breadth, and is chiefly barren and uncultivated. It is in fact an elevated table-land, with eminences rising to heights from fifteen hundred to, in some cases, nearly eighteen hundred feet above the sea-level.” (p. 171.)

I have no doubt that the *Century* has slipped regarding both the horizontal extension and the heights of the principal eminences of our great central upland.

The unqualified statement that Dartmoor “is some twenty-two miles long by about nineteen in breadth” leads, of course, to the conclusion that its area is about 418 square miles. Instead of this, Mr. Godwin-Austen, who, from his residence in the county and his geological studies, knew the moor well, spoke of it as “occupying about 200 square miles of surface.” (*Trans. Geol. Soc.*, 2nd Ser. vi. 478.) As a matter of fact, Dartmoor, taking the word in its widest sense, measures about 22 miles in extreme length, and 17·5 in extreme breadth, according to the Maps of the Geological Survey. The average breadth, however, does not exceed 12·5 miles, so that the area is not more than 275 square miles.

The *Century* speaks of the eminences as “rising to heights of fifteen hundred to, in some cases, nearly eighteen hundred

feet above sea level." According to Mr. M'Lauchlan of the Trigonometrical Survey, as quoted by Sir H. De la Beche (See *Report on Geol. Cornw., &c.*, p. 14), there are no fewer than four of the eminences which exceed 1800 feet. Yes Tor being 2,050 feet; Amicombe Hill, 2,000; Fur Tor, 2,000; and Newlake [? Newtake] Hill, 1925 feet.

In short, the *Century* slipped into excess in the matter of horizontal extension, and into defect with regard to the height of the chief eminences.

III. "NOBLE, *Turned to Nine Pence.*"

The *Sixth Report of the Committee on Devonshire Folk-lore* contains the following Contribution under the Heading "Popular Beliefs and Sayings:"—

"The prospects of a young man, at one time seeming most prosperous, had assumed quite a different aspect owing to his own mismanagement, and the change was thus tersely described, 'So his noble has turned to nine pence.'

"I can find no account of the noble having been made in England since Henry VIII. It was of gold, and worth about a guinea." (*Trans. Devon. Assoc.* xv. 105, 1883.)

Though there is nothing in the Report to show where, when, or by whom the Saying was uttered, the conditions under which the Report was sent in warrant the conclusion that the Saying was heard in Devonshire some time in 1882 or 1883; and as it appears to contain a Slip, I avail myself of this opportunity of offering a few remarks—

1st. On the Saying.

2nd. On the History of the Noble.

3rd. On the value of the Noble.

1. *The Saying*:—The Saying or Proverb, "His noble has turned to ninepence," or some closely approximating variant of it, such as "He'll turn his noble to ninepence," has been familiar to me all my life, having often heard it both in Devonshire and in Cornwall; and, provided it is not regarded as *confined* to this county, it is entitled to take its place in our Folk-lore as a *Devonshire Saying*. It occurs in Bohn's *Hand-Book of Proverbs* (1870, p. 372) in the form of "He has brought his noble to ninepence," and has occupied the attention of a few writers in *Notes and Queries* (3rd Series vii.), where "E. S. S. W." introduced it in the form of "His noble has come down to ninepence" (p. 219), while "H. B. C."

expressed the belief that the Saying was in general use; adding that in Oxon and Bucks the course of persons living beyond their means was described as calculated "To bring a noble to ninepence, and ninepence to nothing." (p. 290.)

Though, as intimated by the writer of the Contribution now under notice, the Noble may not have "been made in England since Henry VIII.," its name as a denomination of money, though not as a coin, has lasted to even the present day, since many school-books on Arithmetic still give it a place in their Tables of Money, Weights, and Measures, just as the Guinea is still spoken of, and fees and subscriptions are frequently paid in that amount, though few persons now living can have seen a Guinea as a coin in circulation. Indeed, certain denominations of money, such as a Pound and a Mark, were never actual coins. Is it too much to suppose that if, as is commonly believed, a lawyer's fee is six shillings and eightpence, it is a Survival of the Noble, the value of which was precisely that amount?

Shakspeare, born after Nobles had ceased to be coined, uses the word at least three times; and though the Plays in which it occurs all represent pre-Tudor times, they are restricted to the era of York and Lancaster when there was certainly such a coin; and it cannot be doubted that the word was very familiar to the playgoers of Elizabeth's time. Thus in the well-known scene in the 2nd *Part of Henry IV.* (ii. 1), Falstaff, endeavouring to wheedle money from Hostess Quickly, says

"Let it be ten pound if thou canst."

To which the Dame replies:

"Prithee, sir John, let it be but twenty nobles."

Again, in "*Henry V.*" (ii. 1) the following passages occur in a conversation between Pistol and Bardolph:—

Pist. "A noble shalt thou have, and present pay:
And liquor likewise will I give to thee,
And friendship shall combine, and brotherhood."

Bard. "I shall have my noble?"

Pist. "In cash most justly paid."

The third passage, noteworthy since Shakspeare in it puns on the word, occurs in *Richard III.* (i. 3), where the Duke of Gloster, replying to the widowed Queen of his brother Edward IV., complains that

"Great promotions
Are daily given to ennoble those
That scarce, some two days since, were worth a noble."

Should it be asked why "ninepence," rather than any other comparatively small amount, was introduced into the Saying, it will no doubt suffice to reply that Proverbs and Sayings, must not only be pithy, but require all the aids to memory; hence they are not unfrequently short rhyming couplets, such as

"Birds of a feather
Flock together."

"A stitch in time
Saves nine."

or alliteration is made to do duty, as in

"A libertine's life is not a life of liberty."

"A miss is as good as a mile."

"Care killed a cat."

"He has a bee in his bonnet."

Occasionally, a Proverb is at once alliterative and rhyming, as in

"Children and Chicken
Are always picking."

In Oxford and Buckingham shires, as we have already seen, the Saying under consideration takes the form of "To bring a noble to ninepence and ninepence to nothing," and becomes more alliterative than in the more usual form.

2. *The History of the Noble* :—The following brief historical sketch has been compiled from *The Coinage of the British Empire*, by Henry Noel Humphreys, 1854, and the *Penny Cyclopædia*, Articles ANGEL (II. 13) and COIN (VII. 330); the P.C. articles being apparently based on Pinkerton's *Essay on Medals*, ed. 1789, ii. 72-78.

From the Norman Conquest the gold coins current in England were foreign until A.D. 1257, when Henry III. "made a penny of the finest gold." The gold coinage of England, however, may be said to have commenced virtually with Edward III., whose first gold coins were Florins (= Florences) struck in 1344, and went for six shillings, which being inconvenient, as forming no aliquot part of larger ideal denominations, seems to have been withdrawn. In the same year another gold coinage was determined upon, and the pieces were called Nobles, Half Nobles, and

Quarter Nobles. Selden, a poet of the reign of Henry VI., writes, with reference to this coinage—

“But king Edward made a siege royall,
And wonne the town and in speciall
The sea was kept, and thereof he was lord;
Thus made he nobles coins of record.”

The “siege” was, no doubt, that of Calais, begun in 1346, two years after the Noble was first coined. It is true that Edward began the siege of Tournay in July 1340, but in that instance it could not be said that he “wonne the town.”

Snelling, in his *Coins of Great Britain, France, and Ireland, &c.* (1823), speaking of the Obverse Type of this first English Noble, says, “It exhibits the king standing upright in the middle of a ship in armour, with his sword erect in his right hand and his shield in his left, on which appears the quartered arms of France and England;” and he adds in a foot note, “The gold money in general received their name from their type . . . and it is very probable this coin received its name on the same account, its type being expressive of the king’s NOBLE resolution to maintain the sovereignty of the sea, and at the same time commemorative of the NOBLE victory which he had obtained over his enemies some time before, on that element, and this appears to have been the opinion of an ancient author in MS. in the Cottonian library (Selden’s *Mare Clausum*, p. 394), who says—

“For four things our NOBLE sheweth to me,
King, ship, and sword, and POWER OF THE SEE.”

The “Noble victory” here mentioned was, of course, that gained by Edward III. and his allies over Philip King of France, on 13th June 1340, off Sluise in Flanders, where the English with 240 sail defeated a French fleet of 400 vessels manned by 40,000 men, took 230 French ships, and killed 30,000 Frenchmen. (HUME’S *England*. Chap. xv.)

Capgrave (1393–1464), writing of the ransom of King John of France paid to Edward III. of England in 1360, says “So was the Kyng of Frauns delyvered, and his raunsom set at iii. milliones of florenes, of whch two schuld weye a nobil.” (Hingeston’s Capgrave’s *Chronicle of England* 1658, p. 220.)

The Noble and its divisions continued to be the only gold coins of the realm down to the reign of Edward IV. who, in 1465, introduced from France the Angel, so called from bearing the figure of the angel Michael standing upon the dragon, and piercing him with a spear. Its value, however, being the same as that of the Noble, it was sometimes called

the Noble Angel. The only known gold coins of Richard III. are Angels and Half Angels. In the reign of Henry VIII. there were the old Noble, now called the Rose Noble, to distinguish it from the new George Noble, which bore on its obverse St. George and the dragon.

There seems no reason to believe that Nobles were coined after this reign; they were not withdrawn from circulation, however; for in the Accounts of the Churchwardens of the parish of Stoke Gabriel, South Devon, the following entry occurs in the year MCCCCCLX. :—

"It. payd for exchange of foreteen nobles of basse money ijs. iiijd."

3. *The Value of the Noble*:—When the writer of the Contribution now under consideration stated that the Noble was "worth about a guinea" he no doubt slipped into an error.

When first coined, in 1344, it was "published at six shillings and eightpence, that is half of a Mark, or one third of a Pound;" and that sum is recognised as its value in all modern schoolbooks. Henry V. is said to have diminished the coin, but still to have made it pass for its former value. Henry VI. restored its size, but increased its value to ten shillings; it ceased at the same time, however, to be a Noble, and the new name of Ryal was given it. Henry VIII. in 1527, coined Crowns and Half-Crowns at their present values, Sovereigns valued at 22s. 6d.; Ryals, at 11s. 3d., or half the Sovereign; Angels, at 7s. 6d., or one-third of the Sovereign; and Nobles at 6s. 8d. as before. (See *Pen. Cyclo.* vii. 330.)

The conversation, already quoted, which, according to Shakspeare, passed between Falstaff and Hostess Quickly, furnishes some indication of the value of the Noble in Queen Elizabeth's reign. The Knight, as we have seen, craved a loan of "ten pound." The Hostess, in reply, pleads her poverty, and begs him to "let it be but twenty nobles," and thus establishes the fact that the Noble did not pass for so much as ten shillings. She, no doubt, asked him virtually to be content with two-thirds of the sum he named.

IV. PLYMOUTH: *And the Watchman at Rame.*

The *Journal of the Royal Institution of Cornwall* (1882, vii. 207-9) contains a Paper entitled *The Watchman at Rame*. The Title written fully would, no doubt, be *The Watchman at Rame Head*—a headland which may be

termed the western horn of Plymouth Sound, and about 5.5 miles, as the crow flies, from Plymouth Citadel. It is a commanding point, and a straight line from it to the Lizard Point—upwards of 50 miles distant—is nowhere interrupted by land. It is not surprising therefore that the author of the Paper is able to state that there are “scores of entries concerning the watchman at Rame scattered up and down the municipal accounts of the borough of Plymouth.”

Of these entries he gives the following, occurring in the year 1486, as “the earliest that can now be traced” :—

“Item payd vnto the whaycheman att Rame ffor keyping off ye bekyn ther & brinyng iiij tymys iiijd.” (p. 208.)

On this entry the author remarks “The charge therefore was not a heavy one; a penny a time for coming from Rame to Plymouth and going home again is no extravagant sum, even if we reckon the money at eight times its present value.” It is obvious therefore that he regards the word “brinyng,” in the entry quoted above, as a fifteenth century equivalent of the nineteenth century word “bringing.” I venture to believe that he has made a slip here, and that the word under notice is an archaic form of “burning,” not “bringing.”

It is well-known that the verb now written *To Burn* was formerly written sometimes *To Bren*, sometimes *To Brin*, and sometimes *To Bryn*, and that each form produced corresponding derivatives. The following examples were collected during a short search among publications of the *Early English Text Society*.

BRENNE = Burn :

“pyn herte shulde *brenne* for grete loue,
When þou hyt takest to þy behoue.”

(*Meditations on the Supper of our Lord, &c.* By Cardinal John Bonaventura. *Drawn into English Verse* by Robert Manning of Brunne. About 1315–1330.)

BRENNANDE = Burning: “And also it is ordeyned, by comoun assent, yat ye forseyde bretheren and sisteren shullen offeren a candel *brennande* in ye forsayde Chirche.” (*English Gilds*, by Toulmin Smith. From “Returns” made in 1389, p. 17.)

BRENDE = Burnt; BRENNINGE = Burning:

“Ȝor-fore hem cam on more for.
fier is on hem bi-aiden ligt,
fele it *brende* and made o-frigt,
Moyses it bless[ed]e wiȝ his bede,
And *brenninge* he calde ȝat stede.”

(*The Story of Genesis and Exodus*, lines 3650–3654. About 1250.)

BRENNYNGE = Burning: “And þe to torchis, eueri day in þe zer, schullen ben light and *brennyng*e at þe heye messe at selue auter.” (*Eng. Gilds*, p. 14.)

BRIN = Burn:

“So it bifell opon a ȝere,
Al þe cuntré, fer and nere,
Vnto ierusalem þai went
To honore þat tre with gude entent;
A woman was þare þam omang
Ȝat in hir hert ay hopid wrang;
Scho soght þeder þe sight to se
And trowed no vertu in þe tre;
Hir thocht it was scorne in hir wit
Ȝat oþer men so honord it;
Maximilla was hir name,
Scho sat þaron hir selfe to schame,
And for scho trowed no might þarin;
Hir clathes biliue bigan to *brin*
Als herds þat had bene right dry.”

Legends of the Holy Rood; in Old English of the 11th, 14th, and 15th Centuries, p. 80, lines 667–681.)

BRINT = Burnt:

“Maist lyke ane branche doun cuttit of ane stok,
That is becum ane drye and widderit blok.
Meit for no werk that man wald do desyre,
Bot to be *brint*, and cassin in ane fyre.”

(*Minor Poems of William Lauder*. About 1568, p. 6, lines 97–100.)

BRYNT = BURNED:—“He sleu men, vemen ande childir, zong ande ald, ande *brynt* there housis.” (*Complaynt of Scotlande*. 1549, ch. ix., p. 76, lines 4–6.)

“Thai vaistit and *brynt* northt humyrland.” (*Ibid.* ch. xi. p. 97, lines 10–11.)

BRYNNYG = Burning :—

"And Marcial saith men in dyvers wyse
Her figges keep, and oon for everichooone,
As campaine hem keepeth, shall suffice.
On fleykes brede and drie hem is to doone
And yet al softs in baskettes repone.
And in an oven hoots upon iii stonys
For *brynnyg* it this figgy basket doon is."

(*Palladius on Husbandrie*. About 1420, p. 127, st. 95.)

BRYNNYNGE = Burning :—"All þat kyndills þi lykyng in
brynnynge of charite." (*Religious Pieces in Prose and Verse*.
About 1440, p. 22, line 18.)

The Book of Husbandry, by Master Fitzherbert (1534),
edited by the Rev. W. W. Skeat for the *English Dialect Society* (1882), contains the following passages :—"In somme
places they wyll shere theyr cornes hygh, to the entente to
mowe theyr stubble, eyther to thack or to *bren*." (¶ 27, line 10.)

"If thou haue any woddes to felle, for thy householde to
brenne, or to sell." (¶ 131, line 1.)

It appears from the Glossaries already published by the
English Dialect Society, that all the foregoing archaic forms
have dropped out of the spoken English of the present day,
but that the cognate form of "*To BRUN*" = "*To Burn*," is still
current in Lancashire and in the neighbourhood of Whitby.
(See the *Glossaries* of Messrs. J. H. Nodal and G. Milner,
1875, and of Mr. F. R. Robinson, 1876.)

A similar search among the publications of the two
Societies named above has failed to supply a single example
of *Brining* or *Brinning*, *Brinyng* or *Brinnyng*, *Bryning* or
Brynnung, *Brynyng* or *Brynnying*, as an archaic form of the
participle *Bringing*.

According to the entry now under notice, the watchman at
Rame had to keep the *beacon* there. The following definitions
of a BEACON are given by authors :—

BAILEY (*Dict.*, ed. 1726). "A long Pole set upon a rising
Ground, near the Sea Coasts, on which Pitch-barrels are
fastened ready to be fired, to give notice of Invasions, prevent
Ship wreck," &c.

JOHNSON (*Dict.* ed. 1784). "1. Something raised on an
eminence, to be fired on the approach of an enemy, to alarm
the country. . . . 'The king seemed to account of Perkin as

a May-game; yet had given order for the watching of *beacons* upon the coasts, and erecting more where they stood thin.'—*Bacon*.

“ ‘No flaming *beacons* cast their blaze afar
The dreadful signal of invasive war.’—*Gay*.

“2. Marks erected, or lights made in the night, to direct navigators in their courses, and warn them from rocks, shallows, and sandbanks.”

PENNY CYCLOPÆDIA (Art. *Beacon*, iv. 525). “A sign or token ordinarily raised upon some foreland or high ground as a sea-mark. It is also used for the fire-signal which was formerly set up to alarm the interior of a country upon the approach of a foreign enemy. . . .

“Lord Coke” [1552–1633], “in his Fourth Institute, Chap. xxv., speaking of our own beacons, says, ‘Before the reign of Edward III. they were but stacks of wood set up on high places, which were fired when the coming of an enemy was descried; but in his reign pitch-boxes, as they now be, instead of those stacks were set; and this is properly a beacon. . . .’

“An iron beacon or fire pot may still be seen standing upon the tower of Hadley Church, in Middlesex. Gough, in his edition of Camden, fol. 1789, vol. iii. p. 281, says, at Ingleborough, in Yorkshire, on the west edge, are remains of a beacon, ascended to by a flight of steps, and ruins of a watch house. . . .”

ENCYCLOPÆDIA BRITANNICA (8th ed. Art. *Beacon*, iv. 525). “An ancient species of signal, consisting generally of a long pole to which was fastened a pitch-barrel to be fired by night, and to produce smoke by day. These were erected on conspicuous eminences, to give notice of an approaching invasion.”

There seems no manner of doubt that burning or, to use what appears to have been the language of the time and locality, *brinyng* the beacon there when necessary was among the duties of the watchman at Rame; and that he actually performed the service is put beyond question by the following entry in the Plymouth accounts in 1543–4, quoted in the Paper now under comment:

“Itm. to the waycheman at Rame when the bekenys were *burnyd* iiij^d.”

His duties, however, embraced Commerce as well as War, as is shown by the following entries in 1543–4, which are also quoted:

"Itm. pd. to the waycheman at Rame when the Sowthermen came home, iiij^d."

"Itm. for his comyng hether by nyght when the new founde land men came yn viij^d."

In 1486, the year of the first entry, that especially under notice, Lambert Simnel, the pretender set up by the Yorkists, was in Ireland, whence an invasion of England was threatened and, indeed, was made; and this, perhaps, may have led to great watchfulness at Rame Head and other stations; while the fact that Henry VIII., leagued with the Emperor Charles V., was at war with France, and actually invaded that country in the summer of 1544, is apparently sufficient to account for the statement in the entry just quoted, that "the bekenys were burnyd" at Rame that year.

I will not now enter on the questions of the purchasing power of "iiij^d" in 1486, or whether it is reasonable to suppose that Plymouth alone, of all the parishes surrounding Plymouth Sound and its numerous inlets, bore the sole charge of remunerating the watchman at Rame Head for the discharge of his important duties. Enough has probably been said to show that a charge of stinginess on the part of Plymouth in the matter cannot be sustained.

V. SIDMOUTH: *The Rainfall at.*

A friend has called my attention to the following statement respecting Sidmouth, in *Deacon's Court Guide Gazetteer and County Blue Book: A fashionable Register and General Survey of Devonshire*. 1 Ed., 1882 (p. 274):—

"It has been calculated by Mr. Pengelly, F.R.S., that it" [Sidmouth] "has about one quarter less rainfall than any of the other fashionable watering places in the county."

It may be assumed, no doubt, that the writer of the paragraph just quoted was alluding to one, or perhaps more, of a series of Papers on the Rainfall in Devonshire during the years from 1866 to 1873 inclusive, which I have printed in the *Transactions of the Devonshire Association* (vols. ii. to vi.), in which are recorded the actual rainfalls registered at numerous stations in the county, and a few calculations indulged in on the data collected. These calculations, however, had no special reference to Sidmouth until 1871; and the following are the only facts during the preceding 5 years which need be mentioned respecting that town:

In 1866 the rainfall at Sidmouth was 18 per cent. below the county average that year, and 3 stations had smaller rainfalls. The number of wet days was 2 per cent. below the county average, and 8 stations had a smaller number.

In 1867 the rainfall at Sidmouth was 16 per cent. below the county average that year, and 5 stations had smaller rainfalls. The number of wet days was 2 per cent. below the county average that year, and 8 stations had a smaller number.

In 1868 the rainfall at Sidmouth was 27 per cent. below the county average that year, and 3 stations had smaller rainfalls. The number of wet days was 1 per cent. above the county average that year, and 9 stations had a smaller number.

In 1869 the rainfall at Sidmouth was 31 per cent. below the county average that year, and 1 station had a smaller rainfall. The number of wet days was 1 per cent. below the county average that year, and 11 stations had a smaller number.

In 1870 the rainfall at Sidmouth was 34 per cent. below the county average that year, and 2 stations had smaller rainfalls. The number of wet days was 7 per cent. below the county average that year, and 14 stations had a smaller number.

As might have been expected, there were considerable changes in the list of Stations from year to year—some being discontinued while new ones came into existence; hence, after a few years, there was but a comparatively small number at which records had been kept continuously for several years; thus, in 1871 there were but 25 which had persevered for 6 continuous years, in 1872 there were 25 for 7 years, and 1873 there were 24 for 8 years. It seemed desirable, therefore, to tabulate the annual averages during the 6, 7, and 8 years, as wholes, at the continuous stations; this was accordingly done in my Paper for each of the three years just mentioned (1871, '2, '3), and the following is one of the statements made on the Tables:—"That the least average rainfall occurs at Sidmouth, and is 26 per cent. below the average of the county" [as represented by the continuous stations]. (*Trans. Devon. Assoc.* vi. 455.)

The "26 per cent." just mentioned is so very nearly "one-fourth" that there can be little or no doubt that the statement in which it occurs was the passage to which the writer alluded in the quotation from him now under comment. It will be

seen, however, that he *slipped* into an error; for according to him my calculation had reference only to the "fashionable watering-places in the county," whereas it really referred to the county as a whole, which was fairly represented by the continuous stations—including Prince Town with its average annual rainfall of 75·36 inches, as well as Sidmouth with its 31·89 inches.

Frequenters of fashionable watering-places, however, are probably more affected by the frequency of wet days at the said places than by the aggregate rainfalls. It cannot be denied that a wet day is a wet day; and for pleasure-seekers and health-seekers it usually means captivity. Now, my Papers, to which reference has been made, contain Tables showing the mean annual number of wet days at all the "continuous stations;" showing also that Sidmouth was no more than 3 per cent. below the county as a whole in the number of its annual number of wet days on the average; and that there were 5 stations in the county having a smaller number than Sidmouth.

In short, I have never made, nor attempted to make, any calculation with regard to the rainfall at Sidmouth, as compared with that of the other fashionable watering-places in the county; but my Papers show and state that while the Sidmouth average annual rainfall, during the 8 years from 1866 to 1873 inclusive, was 26 per cent. below that of the county as a whole, the average annual number of wet days at the same station was but 3 per cent. below the county average for the same period; and that in relation to its rainfall no station in the county exceeded it, and but two equalled it, in the number of its wet days.

It should be added that, all other things being the same, a high station receives more rain than a low station; hence, to be strictly comparable, the stations should be at one uniform level. Now, the "continuous stations" which furnished the data for my calculations, varied from 1,400 feet above the sea-level, at Prince Town, to 26 feet at Sidmouth, and averaged 265 feet. This element alone would therefore lead one to expect a low average rainfall at Sidmouth, *as compared with the county as a whole*; and this expectation was realized.

A CONTRIBUTION TO
THE COMPARATIVE METEOROLOGY OF TORQUAY,
TEIGNMOUTH, AND SIDMOUTH.

BY W. C. LAKE, M.D.

(Read at Newton Abbot, July, 1884.)

IN estimating the meteorological conditions of any place relatively to those of any other, it is necessary, I need hardly say, that the observations should be made with instruments in every respect comparable, and that they should be taken not only over similar periods of time, but also during the same period of time. I propose to lay before the Association the result of observations thus made for Torquay, Teignmouth, and Sidmouth, which I hope will be of interest as a contribution to the comparative meteorology of these places. The different stations are, for Torquay, those at Castle College, Rocombe, and Babbacombe; for Teignmouth, those at Bitton and at Woodway; and for Sidmouth that at Sidmouth. The observations compared are those taken during the three years 1880, 1881, 1882; but I have also given those for Bitton, Babbacombe, and Sidmouth for six years; viz., from 1877 to 1882, both inclusive, and I have added the means for Bitton for the last ten years. Of the Torquay stations Babbacombe is situated on limestone at an elevation of 293 feet, Rocombe on shale at an elevation of 400 feet, and Castle College on limestone at a height of 166 feet above sea-level. Taking the mean maximum and mean minimum temperatures, regarding Castle College as most nearly representing the town of Torquay, it may be noticed that the mean maximum temperature there for November, December, and January was higher than at Rocombe by half a degree or more, and for December was higher by 0.5 at Babbacombe, and that the mean minimum was higher there than at Babbacombe in October,

November, and December, and at Rocombe in November, December, and February by amounts varying from 0.5 to 1.0; that in March, April, May, August, and September the mean maximum was lower than at Rocombe by amounts varying from 0.6° to 1.2°, and lower than at Babbacombe in June, July, August, and September by from 0.9 to 1.2; that the mean minimum was higher there than at Rocombe in March, April, June, and July by from 0.7 to 1.4, and higher than at Babbacombe in April, June, July, and August by from 0.5 to 1.1. In all the other maxima and minima at these stations the differences were less than half a degree.

With regard to moisture, in January Castle College and Babbacombe were both somewhat drier than Rocombe. In February there was a slight difference to the advantage in dryness with Castle College over Rocombe, and with Babbacombe over Castle College. In March, April, May, and June Castle College was a good deal moister than the other two stations, in May particularly so. In July Babbacombe had the advantage in this respect of both Castle College and Rocombe. In August the degree of humidity at each station was alike. In September Castle College was somewhat moister than either Rocombe or Babbacombe. In October somewhat drier than the former, and somewhat moister than the latter. In November Babbacombe had a slight advantage over the other two stations; while in December there was a similar advantage with Rocombe. The relationships of the Torquay stations may be thus summed up. That as to temperature through the largest part of the year, the difference between the day and night temperature was on the whole less at the central station than at those outside, and at higher levels; and that as to humidity from March to June, this was decidedly more at the central than at the outside stations; and for the other months the variations between the stations in this respect were slight in one or the other direction.

Of the two Teignmouth stations that at Bitton is 50 feet, that at Woodway 235 feet, above sea-level. Both are situated on the New Red Sandstone Conglomerate. Between these two stations the differences were much more marked than between either of those at Torquay. The mean maximum temperature for each month was higher at Woodway than at Bitton by amounts gradually rising from 0.3° in November and December to 3.1° in July, falling then again towards November. The mean minimum temperature was for each month lower at Woodway than at Bitton by amounts varying irregularly, being for one month under 1°, for four months

between 1° and 2° , and for the remaining months above 2° , the greatest difference being 2.9° . The amount of humidity for each month was greater at Woodway than at Bitton, in some months to a considerable extent.

In comparing the Teignmouth and Torquay stations the following are the results: In every month the mean maximum temperature was higher at Bitton than at any Torquay station, except that in July this was 0.2° higher at Babbacombe. The mean minimum temperature was also higher for nearly every month at Bitton than at any Torquay station, the exceptions being that for February this was 0.1° higher at Babbacombe, and 0.3° higher at Castle College; that for November, this was 0.2° higher at Castle College; and for December, this was alike at Bitton and at Castle College. The excess of the mean maximum temperature at Bitton above that for the Torquay station, at which it was highest for the various months (excluding of course July), was never under 0.5° , and for May and October was 1.2° . The excess of the mean minimum temperature above that for the Torquay station, at which it was highest for the various months (excepting February, March, and December), was usually under 0.5° , the greatest being 0.7° for June and August, and 1.2° for April. The mean maximum temperature at Woodway was, as may be gathered from what has been stated above, higher for each month than at any Torquay station, and the mean minimum temperature lower, except that for November this was the same at Woodway and at Babbacombe.

The mean humidity of the air at Bitton was the same as that at the least humid of the Torquay stations for January, July, and October. For each of the other months it was less at Bitton than at any Torquay station. At Woodway the humidity was usually greater than at the Torquay stations; but for March and April it was the same as, and for February, April, and May somewhat less than, that which obtained at one or other of them.

The station at Sidmount, Sidmouth, is 186 feet above sea-level, and is situated on the New Red Sandstone. The mean maximum temperature at this station was for almost every month below that at all the other stations, the exception being that for March. This was alike at Sidmount and Castle College; for April, alike at Babbacombe, and 0.4° higher than at Castle College; for August, 0.1° higher than at Castle College; for November, 0.5° higher than at Rocombe; and for December, 0.5° higher than at Castle College. The mean minimum temperature presents somewhat more variety,

but it was usually lower than at all the other stations except Woodway. The degree of humidity was generally higher than at most of the other stations; but for March, April, and May there was less humidity at Sidmount than at Castle College, and for June this was equal at these two stations. For April, May, and December there was less humidity at Sidmount than at Woodway; while for November this was alike at these two stations. The humidity, which was markedly in excess of that at all the other stations, at Castle College for March, April, and May was similarly markedly in excess at Sidmount for July, August, September, and October.

The preceding records of observations, giving the averages for the three years 1880 to 1882, may, I think, be fairly taken as a means of comparison between the stations for that period. They must not, however, be regarded as representing the true mean value of the different meteorological elements for these stations absolutely, nor indeed their true mean value absolutely for inter-comparison. A time so short as that of three years can hardly help including exceptional months, nor most probably months exceptional as well to one or other of the meteorological elements for the several stations themselves. Their value, therefore, for inter-comparison, though no doubt generally true, must yet need the correction which the tendency to equalization that results from observations over a longer period always gives. The means, therefore, from the six years' comparison must be of greater value for the stations for which they are drawn; viz., Babbacombe, Bitton, and Sidmount. It will be observed that the same general results are obtained, though modified by the equalizing tendency above referred to. The mean maximum temperature was for each month higher at Bitton than at either of the two other stations, and higher at Babbacombe than at Sidmount, except for September, when it was the same, and for December, when it was 0.3° higher at Sidmount, the difference as to mean maximum temperature between Bitton and Sidmount, the extreme stations, being 2.0° or above, except for August, November, and December, when it was between 1.0 and 2.0° . The mean minimum temperature was for each month higher at Bitton than at Babbacombe or Sidmount, and higher at Babbacombe than at Sidmount, except for July, August, September, and October, when that at Sidmount was in excess of that at Babbacombe by from 0.3° to 0.4° . The differences in the mean minimum temperature at these three stations when largest varied from 0.6° to 1.4° .

The degree of humidity was less at Bitton than at either of the other two stations except for January, when Babbacombe had the advantage over Bitton. In February, April, and May the humidity at Babbacombe and Sidmount were alike. For June, July, August, September, October, and November Babbacombe had less humidity than Sidmount; for March and December more. The palpable excess of humidity at Sidmount over that at the other stations for July, August, September, and October, was to be observed in the six years' as in the three years' averages.

The rainfalls at the various stations at the several localities differed amongst themselves and differed irregularly for the separate months. Taking the means from the six years' averages, the rainfall at Sidmount was, on the whole, decidedly less than that at either Babbacombe or Bitton, though for February the amount was smaller at Bitton than at Sidmount, and for July was smaller both at Babbacombe and Bitton.

Of the Torquay stations, Babbacombe most nearly resembles that at Bitton, but still has the Torquay character of generally lower mean maximum temperature. The two Teignmouth stations again alike exhibit the common character of a higher mean maximum temperature. The difference between the Torquay stations, though noteworthy, is not nearly equal to that observed between Bitton and Woodway. For the largeness of this it is not easy to account. The Bitton station is at a comparatively slight elevation above sea-level, is less than a hundred yards distant from the estuary of the Teign, and is situated on the slope of a declivity, separating the Coombe and Brimley valleys, and which at its upper portion is called Yannon Hill. The station at Woodway is at some distance from the sea and river, is at an elevation of 235 feet, and lies on the slope of one of the hills running up towards Haldon. The hills at and about Torquay do not attain a higher elevation than a little over 400 feet, while Haldon rises to 800 feet above the sea. To the more maritime character of the station at Bitton, and to the protection of Yannon Hill, may perhaps be owing its characteristics as compared with those at Woodway.

It is not easy again to estimate to what extent of the locality of Teignmouth the Bitton character may be considered applicable. I should say most likely to the whole slope of the declivity from Yannon to the estuary above mentioned, and possibly to the lower part of the town generally, whilst Woodway probably more nearly represents the character

of the upper part of the slopes occupied by its higher portions.

We must recognise, I think, from all this the desirability of a large increase in the meteorological stations on this coast. One or two more are required at Torquay, and one or two at Teignmouth; while the towns of Dawlish, Exmouth, Budleigh Salterton, Dartmouth, and Salcombe are, as far as I know, unrepresented by any trustworthy records, or by any at least available for comparison with those for other towns. For present and future purposes of inter-comparison, too much value can hardly be attached to the Meteorological Reports of this Association, now so ably presided over by Mr. P. F. S. Amery.

I have thus sketched, all too cursorily, the main meteorological features of the various stations at Torquay, Teignmouth, and Sidmouth. As the period embraced is far too limited for strict scientific averages or comparisons, yet it may be borne in mind, in considering the influence of climate on human beings or on the vegetable world, that it is not average conditions that are really experienced by them, but those that are met with in the accustomed course of meteorological events. It is possible, therefore, that for such a purpose, and for that of comparison, a series of averages of short periods may be even more useful than those deduced from a more extended series of years. Besides the differences in barometric pressure at different elevations, another point also is, in this light, of still greater (shall I say of the very greatest?) importance—the aspect of a locality, or of its several portions, and the degree to which, on this account, they are affected by particular winds. Of these none perhaps more seriously affects either man or vegetation than the east wind. The bulk of Torquay is more or less completely sheltered from this, though several of its outlying parts are exposed to its influence. The bulk of Teignmouth, in its present extent, is more or less completely exposed to it; but in more spots than are usually supposed, and especially along those slopes over which building is gradually extending, full protection is afforded from it. From its aspect Sidmouth is also sheltered from its force.

In conclusion, the comparisons in this way deduced from the observations recorded from the three towns may be thus summarized:

Torquay proper, as far as represented by Castle College, has, with hardly an exception, a lower mean maximum tem-

perature from May to September, a higher mean minimum temperature from March to December, and a greater humidity through the spring months than its outlying stations. As compared with Teignmouth, it has a lower mean maximum temperature throughout the year; with hardly an exception, a lower mean minimum temperature and greater humidity than Bitton, and a higher mean minimum, and, as a rule, a less degree of humidity than Woodway. As compared with Sidmouth, its mean maximum temperature is little different, though somewhat higher for June and July, and somewhat lower for December. Its mean minimum temperature, with hardly an exception, is higher, to the greatest degree for June, August, October, and November. Its humidity is greater for the spring months, less for the summer and autumn. Very full protection is afforded from east wind in the largest part of Torquay; certain portions, in its outlying districts especially, being however exposed to its influence.

Teignmouth, as far as represented by Bitton, has throughout the year, with hardly an exception, a higher mean maximum temperature, a higher mean minimum temperature, and less humidity, than either Torquay or Sidmouth; so far as represented by Woodway, it has a still higher mean maximum temperature and a lower mean minimum temperature, while its humidity, though usually greater, is less than that at Castle College during the spring, less than that at Sidmouth during the summer and autumn months. The largest part of Teignmouth is more or less exposed to the east wind, but portions, especially in its outlying parts, sheltered from it are yearly being occupied by houses.

Sidmouth has, speaking generally, a lower mean maximum temperature than the other stations, most closely resembling Castle College, and a mean minimum temperature generally lower than that at the other stations, except Woodway. Its humidity is not very markedly different from that at the other stations in the first half of the year, with the exception of that at Castle College, than which for the spring months it is much less, but it is markedly in excess during the summer and autumn. Sidmouth enjoys very full protection from east winds.

NOTE.—Since this paper was read an index error of considerable amount has been discovered in my wet bulb thermometer. This therefore vitiates the deductions as to *humidity* for Bitton, Teignmouth, leaving the other points considered as they stand. I hope to refer more fully to this next year.

BITTON, TEIGNMOUTH.

SUMMARY OF LAST TEN YEARS.

	Thermometers in Shade.					Humidity, 9 a.m.	Mean Total Rain in inches.	Mean Number of Wet Days.
	Mean Temperature.	Highest Maximum.	Lowest Minimum.	Mean of all Maxima.	Mean of all Minima.			
						0-100		
January . . .	41.8	58.0	15.7	46.8	36.8	88	3.40	16
February . . .	43.8	59.0	25.7	49.0	38.6	86	3.45	16
March . . .	44.6	63.0	21.4	50.9	38.3	79	1.98	12
April . . .	48.1	65.5	31.0	54.6	41.7	79	3.15	15
May . . .	52.9	78.9	32.1	60.5	45.3	74	2.03	12
June . . .	58.3	81.0	40.9	65.3	51.3	76	2.90	15
July . . .	61.3	84.9	45.2	68.5	54.1	76	2.33	13
August . . .	61.3	77.6	41.2	67.6	55.1	78	2.74	14
September . . .	58.0	74.6	37.3	64.9	51.2	81	3.58	15
October . . .	52.3	69.0	27.9	58.1	46.5	83	4.77	18
November . . .	46.4	62.7	27.8	52.1	40.7	86	4.02	17
December . . .	42.3	60.6	23.5	47.4	37.3	87	3.39	17

MEANS FOR THREE YEARS.

JANUARY.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	43.1	33.8	87	1.68
Rocombe . .	42.6	33.9	89	1.85
Babbacombe . .	43.1	33.9	87	1.78
Bitton . .	43.8	34.1	87.4	1.76
Woodway . .	44.4	31.8	90	1.91
Sidmount . .	...	...	...	...

FEBRUARY.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	48.1	38.7	89	3.85
Rocombe . .	48.0	38.2	90	3.47
Babbacombe . .	48.3	38.5	88	3.86
Bitton . .	48.9	38.4	87	3.47
Woodway . .	49.6	36.7	89	3.76
Sidmount . .	47.5	38.2	91	3.62

MARCH.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	51.0	40.1	84	2.66
Rocombe . .	51.6	39.4	81	2.67
Babbacombe . .	51.3	39.5	81	2.96
Bitton . .	52.4	40.5	79.1	2.76
Woodway . .	53.3	37.8	81	2.94
Sidmount . .	51.0	39.6	81	2.17

APRIL.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	53.0	42.1	83	2.79
Rocombe . .	53.9	40.7	78	2.89
Babbacombe . .	53.4	41.3	79	3.05
Bitton . .	55.1	42.5	76.1	2.80
Woodway . .	56.6	39.6	80	2.88
Sidmount . .	53.4	40.7	79	2.69

MAY.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	60.3	45.8	78	1.04
Rocombe . .	61.5	45.4	72	0.95
Babbacombe . .	60.7	45.7	73	1.00
Bitton . .	62.5	46.3	69.1	0.98
Woodway . .	64.6	44.0	75	1.01
Sidmount . .	60.0	45.0	74	1.19

JUNE.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	62.1	50.1	80	2.86
Rocombe . .	62.2	49.3	77	2.80
Babbacombe . .	63.0	49.6	77	3.00
Bitton . .	63.6	50.8	75.1	2.90
Woodway . .	...	...	...	...
Sidmount . .	61.3	49.4	80	3.21

JULY.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	67.3	53.8	76	2.38
Rocombe . .	67.2	53.2	76	2.09
Babbacombe . .	68.2	53.0	74	2.45
Bitton . .	68.0	54.2	74	2.71
Woodway . .	71.1	51.9	78	2.84
Sidmount . .	65.8	53.5	81	3.14

AUGUST.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	66.1	54.5	79	2.20
Rocombe . .	67.0	54.1	79	2.08
Babbacombe . .	67.3	53.4	79	2.39
Bitton . .	67.9	55.2	78	2.52
Woodway . .	70.4	53.1	79	2.54
Sidmount . .	66.2	53.4	82	2.64

SEPTEMBER.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	62.8	50.4	83	2.96
Rocombe . .	63.6	50.6	82	2.98
Babbacombe . .	63.7	50.0	81	3.33
Bitton . .	64.4	50.8	80.1	3.19
Woodway . .	66.5	49.6	82	3.33
Sidmount . .	62.5	50.4	87	3.22

OCTOBER.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	54.9	44.1	84	6.07
Rocombe . .	55.0	44.1	85	6.00
Babbacombe . .	55.2	43.6	83	6.53
Bitton . .	56.4	44.2	83	6.43
Woodway . .	57.3	42.7	86	6.61
Sidmount . .	54.7	43.2	88	4.90

NOVEMBER.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	52.2	42.9	86	4.31
Rocombe . .	51.4	42.0	86	4.14
Babbacombe . .	52.2	41.9	85	4.55
Bitton . .	53.2	42.7	84	3.75
Woodway . .	53.5	41.9	88	4.12
Sidmount . .	51.9	42.1	88	3.56

DECEMBER.

	Mean Max.	Mean Min.	Hu- midity.	Rain.
Castle College . .	48.9	40.1	89	3.84
Rocombe . .	48.1	39.3	88	3.74
Babbacombe . .	48.4	39.2	89	3.97
Bitton . .	49.4	40.1	87	3.62
Woodway . .	49.7	38.4	94	3.87
Sidmount . .	49.4	39.5	87	3.87

MEANS FOR SIX YEARS.

JANUARY.

FEBRUARY.

	Mean Max.	Mean Min.	Hu- midity.	Rain.	Mean Max.	Mean Min.	Hu- midity.	Rain.
Babbacombe	44.5	35.4	87	3.57	48.6	39.0	88	3.50
Bitton	45.6	35.7	88	3.45	49.6	39.2	86	3.21
Sidmount	...	...	...	...	47.5	38.7	88	3.22

MARCH.

APRIL.

Babbacombe	50.5	38.3	80	2.37	52.8	41.1	81	4.02
Bitton	51.7	39.2	79	2.22	54.2	42.1	80	3.98
Sidmount	49.7	38.3	79	1.86	52.1	40.7	81	3.85

MAY.

JUNE.

Babbacombe	58.7	45.2	76	2.09	63.5	50.6	79	3.35
Bitton	60.1	45.8	74	2.36	64.0	51.6	78	3.28
Sidmount	57.6	44.6	76	2.04	61.9	50.4	80	3.28

JULY.

AUGUST.

Babbacombe	67.4	53.1	76	2.47	66.8	54.3	80	3.56
Bitton	67.8	54.0	76	2.48	67.3	55.5	79	3.39
Sidmount	65.4	53.5	80	2.91	65.7	54.7	82	3.38

SEPTEMBER.

OCTOBER.

Babbacombe	62.1	49.7	80	2.93	56.5	44.8	83	4.40
Bitton	64.5	50.5	80	2.78	57.9	45.5	81	4.38
Sidmount	62.1	50.0	83	2.81	55.7	45.2	85	3.40

NOVEMBER.

DECEMBER.

Babbacombe	50.6	40.2	85	4.11	46.3	36.5	89	3.06
Bitton	51.9	40.7	85	3.66	47.7	36.8	87	3.01
Sidmount	50.0	40.1	86	3.32	46.6	36.5	87	2.77

ON AN EXPLOSION, SUPPOSED TO HAVE BEEN
AERIAL, WHICH WAS HEARD IN EAST AND
SOUTH DEVON,

ON THE 13TH OF JANUARY, 1884.

BY THE REV. W. DOWNES, B.A., F.G.S.

(Read at Newton Abbot, July, 1884.)

ON the morning of Sunday, the 13th of January, 1884, at or about 9.45 a.m., many of the inhabitants of Kentisbeare were alarmed by hearing a prolonged crash or explosion which they could not in any way account for. Nearly everybody who was out of doors seems to have heard it, while people indoors seem also in some cases to have heard it, though in the majority of cases people indoors did not hear it. I myself was in my house busily occupied, and did not hear it. It was however so very generally heard by my neighbours that I made enquiries in the village and district. Many, I found, were under the impression that there had been a clap of thunder, though the state of the weather was itself enough to negative this hypothesis. At the Wyndham Arms Inn, at Kentisbeare, plates and window-panes rattled, and an impression was created that a wall had fallen down in the back yard, so that the occupants of the house ran out to see what had happened. Some lads, walking from Kentisbeare towards Uffculme, thought that cannon had been fired off at no great distance, and they noticed that the birds seemed greatly scared by the noise. A young farmer of Kentisbeare, who was out in the fields at the time, described the concussion as something up in the air; and on being questioned by me as to the direction of it, he pointed to the south-west of the zenith. The noise itself was with tolerable uniformity described by many different persons as two sharp reports with a rumble of several seconds' duration between.

Such was the result of enquiries made, so to speak, at my own door. I pursued my enquiries next in the neighbouring villages under a first impression that it was something of a purely local character, such as an explosion of dynamite or gas. At the hamlet of Kerswell, in Broadhembury parish, about a mile and a half to the south of Kentisbeare, it seems to have been very generally heard, and an impression was fostered in my mind (to which however I do not attach so much weight now) that the focus of concussion might have been over that spot. At Kerswell, as at Kentisbeare, plates rattled, and people were very decided in describing the noise as something *overhead*. It was described by one as like thunder, and yet not like thunder; by another as "tue girt raps;" while one imaginative soul likened it to two or three horses tumbling downstairs. One man leaning against a gate heard a crash over his head, which, he says, made the gate quiver on which he was leaning.

After the above enquiries I came to the conclusion that the report must have been due to the bursting of a meteorite in mid-air, somewhere near my own locality. One thing was very certain. It was not thunder. There were no thunder-clouds on that day. And as it occurred on a Sunday, it could not have been due to blasting operations. The air was still and slightly foggy, and the barometer was and had been exceptionally high and steady. The only other hypothesis which has been suggested, that of earthquake, cannot, I think, be sustained. Every single observer was positive that the noise was *overhead*, westward or south-westward of the zenith, according to the general impression. Moreover, in no single instance could I hear of earth tremors having been experienced. The only evidence in that direction is the rattling of plates and the quivering of a gate, things which would naturally result from an aerial concussion, such as the firing of a cannon or bursting of a magazine, or even from thunder. If the earth itself had trembled, the fact could not have escaped notice, for an earth tremor is an unmistakeable sensation. Moreover, in earthquakes the noise, if any, is an accessory of the tremor, rather than the tremor a very questionable accessory of the noise.

After about a week had elapsed, I wrote to two local newspapers, the *Western Morning News* and the *Exeter and Plymouth Gazette*, relating the circumstance. The result of the publication was that letters came to me from various quarters, proving that the phenomenon had been by no means so locally restricted as I had at first supposed. One of these,

to my no little surprise, was from distant Teignmouth. My correspondent, the Rev. H. Hutchins, says that he heard just such a noise as I had described, and at the very same time. I will quote some of his words: "I am able" (he says) "to be tolerably exact about the time. . . . My house is situated some half-mile from Teignmouth. . . . To save time, I had gone outside my gates, and was standing on the highway a few minutes before ten o'clock. I then heard a *deep, solid, sudden, thud*, giving me the idea of a tremendous explosion some long distance off. It was peculiar in its *solidity* and the *abruptness* of its *commencement*. There was after it, for nearly a quarter of a minute, a continuation of a very similar kind, once somewhat diminishing in intensity, and then swelling out till it ceased." This is the clearest detailed description that I received; and it is evident that it agrees in general terms with the "two reports with a rumble between," which is the essence of the answers given me at or near Kentisbeare.

Another description came to me from West Buckland, near Wellington, in Somerset, a distance of over forty miles in a straight line from Teignmouth. My correspondent says: "I think it may interest you to know that the explosion on Sunday, the 13th of January, of which you have written, was distinctly heard by me whilst walking on my farm. Your corrected time, 9.45, is right. It was a sudden, sharp noise, with a rumble lasting, I should think, ten or twelve seconds. I told my family I was afraid we should hear of some disaster in the direction of Plymouth. I was at the time about half a mile from Leigh Camp. Your solution of the mystery, I should think, is correct. I am confident it was an explosion of some kind."

Teignmouth and West Buckland are the two most distant points from which descriptions reached me. I also ascertained that it was heard at Uploman, Uffculme, Culmstock, Collumpton, Broadhembury, Plymtree, Payhembury (where I am told that plates and saucepans rattled), Broadclyst, Whimble, and Ottery St. Mary. If I had not heard from Teignmouth I might have supposed Broadclyst or Ottery to have been the southern limit. As it is I have ascertained that throughout an oval tract of country stretching N.E. and S.W., having a major axis of over forty miles, and a minor axis of about twelve miles, the same sound was simultaneously heard. The descriptions from all quarters agree in a very marked manner.

Of course it is more than probable that the area over

which it was actually heard might have been very much larger than this; for the ascertained area is necessarily a minimum. The accounts of the direction from which the sound apparently came were rather conflicting, but point generally to the westward. In my own immediate district people pointed to the south-west, while in some of the adjoining parishes I was told that it came from the south, and in others that it came from the west. Both at Teignmouth and at West Buckland, the two extreme points of our area, the impression was that it came from the westward or south-westward. If it really occurred to the south-westward of our area, it is strange that no notice should have been taken of it in districts further to the south-west. Only one correspondent from further west than Teignmouth wrote to me; but it was only to say that he had *not* heard the phenomenon in question, though he fancied that he heard something similar to it on a subsequent day.

The only hypothesis that I can suggest is that which I have already suggested in the newspapers; viz., the bursting or collision of meteorites. It was observed by Mr. Hutchins that the air on that morning was in a very favourable condition for conveying sound; but for a sound to be heard equably, uniformly, and simultaneously (or nearly so) over so large an area would imply a considerable *altitude* for the focus of concussion. A thunder-clap is manifestly out of the question, and an earthquake, as the people in the east of England have since learnt to their cost, is a thing to be *felt rather than heard*. Nor has the hypothesis of earthquake been suggested by any one actual observer.

As there are recorded instances of meteorites exploding like shells in mid-air, it may be deemed superfluous to suggest a theory for this somewhat exceptional phenomenon. A meteorite must be either solid or vesicular. If solid, the unequal conductivity of the component parts of a substance suddenly heated seems to be the most probable *vera causa* for an explosion, while, if it contain cavities, the sudden expansion of gases might be cited as sufficient cause. The shattered fragments in turn would probably be all pulverized by combustion before they reached the earth's surface, if they still had far to fall. Thus no fragments would be picked up.

That in the present instance there was nothing visible in the air at the time of the explosion might be accounted for thus: It was broad daylight, the atmosphere was thick and foggy, and there is every reason to suppose that the altitude was considerable.

ON EARTHQUAKES IN DEVONSHIRE.

BY EDWARD PARFITT.

(Read at Newton Abbot, July, 1884.)

PARTS of Devonshire have from time to time been shaken by earthquakes, and it occurred to me, soon after the last shaking we had, on June 25th, 1883, that it would be well to collect all the information I could on the subject, considering it quite within the province of this Association. Earthquakes from the very earliest times to the present have puzzled philosophers as to their cause, the results of which are abundantly present in various parts of the world. The great loss of life and destruction of property are too familiar to require to be particularised. From some cause unexplained there have been more shocks of earthquake recorded for the year 1883 than for many years past. On June 13th shocks were felt over the entire district of Bergen and Aalesund, but more severely in the well-known Dalsfjord. A further shock was felt over the same district on June 15th, at 1.30 p.m. On June 19th the island of Ometepe, in the Lake of Nicaragua, was devastated by an outbreak and eruption. On July 28th a shock of earthquake occurred at 7 o'clock on Sunday morning at Gurgitello. This shock was preceded, however, by an extraordinary increase in the temperature of the thermal waters at Casamicciola, but the inhabitants seem not to have taken warning that some outbreak was about to happen. On July 25th the Solfatara of Albano, one of the extinct Latin volcanoes on the southern side of the Roman Campagna, sent forth sounds such as never were heard before.* On August 16th shocks were felt in the Engadine, and though not of a severe character, still enough

* See map and full particulars of this outbreak in *Nature*, September 6th, 1883, pp. 437-39.

to shake or move beds, &c. Then, as a sort of finale, we had communicated to us the terrible catastrophe that occurred in Java, August 26th, 27th, 1883. In 1786 Java was greatly shaken by an earthquake which lasted four months; great clefts of the earth opened from which sulphurous vapours issued, in other places the earth sank and produced chasms, into one of which the river Dolon-Bach flowed, and in future followed a subterranean channel from that place. At this time the village of Djampang was swallowed up with all its inhabitants.

The cause of earthquakes is still to be ascertained. The ancients regarded them as lightning shocks occurring in the earth, and we shall see that perhaps this is not so bad a comparison, when we consider how very local some are and how direct some of these local shocks have been traced. Colonel Parnell, in an article in the *Journal of Science*, ser. 3, vol. iv. pp. 697, vol. v., quite endorses this, and educes some very strong evidence in support of earthquake shocks being neither more nor less than electric discharges from the reservoirs of the earth. On the other hand, Mr. Howorth, in *Nature*, vol. x. 1874, believes that volcanoes are the immediate result of the shrinking of the earth. In 1852 Dr. Buist, of Bombay, in a letter to Prof. Baden Powell, says, "It is now well established, that in India, at all events, earthquakes are always accompanied by furious storms of thunder, lightning, and rain. It is difficult to trace the cause of coincidences so remarkable in commotions of the earth and the air."

Earthquake waves travel at different velocities through different rocks. From a number of experiments conducted by Mr. Mallet, he found that the velocity through sand was 825 feet per second, and through solid granite 1665 feet per second. Theoretically, however, this is not considered to be correct, as joints, &c., in rocks would interfere with the velocity.

In 1755, the Lisbon earthquake is computed to have travelled about 20 miles per minute, or 1760 feet per second. The shock at Naples was calculated by Mr. Mallet to have a mean velocity at the surface of 788 feet per second, whilst the greatest velocity of the wave-particles was never more than 15 feet per second.

"But though seismic energy may thus become sensible at any point of the earth's surface, there are, as everyone knows, certain regions particularly subject to earthquakes, and it is, in fact, possible to trace seismic bands of variable width following the great lines of elevation which divide the

oceanic basins." From Mr. Mallet's discussion of his Catalogue of Earthquakes for three centuries, he was led to sketch definite periods of maximum seismic energy. Thus it is found that the "greatest number of earthquakes are recorded about the middle of each century, with a second epoch, less powerful than the first, occurring towards the close of each century." *

And according to Perrey there is a preponderance of earthquake shocks at particular seasons; namely, at the equinoxes and solstices, which he terms critical periods. Mr. Mallet somewhat confirms this, and finds that the maximum occurs about the winter solstice. Mr. Richard Edmonds, jun., has, in a paper read at the meeting of the British Association, held at Cambridge, 1845, endeavoured to establish a connexion between the lunar phases, or the relative positions of the moon to the earth, and the periodicity of earthquakes. In this he seems to me to have failed completely. Like many other things, they sometimes agree, but in others fail. In this Mr. F. W. Rudler, the writer of the article in the *Encyclopædia Britannica* (9th edition), partly agrees; but he says, "In the present state of our knowledge it would be rash to regard seismic force, whatever it may be, as a distinctly periodic force, or to insist upon any of those relations between earthquakes and meteorological phenomena which have sometimes been discussed."

Baron Humboldt is of the opinion, from the various experiments instituted by him, having lived a great deal in countries where earthquakes very frequently occur, that no perceptible change can be discovered prior to, or at the time of, earthquake shocks, in the electrical condition of either the earth or its atmosphere. This distinguished traveller says, "During the violent earthquake of Cumana, on the 4th of November, 1799, I found the declination and the intensity of the magnetic force alike unchanged; but to my surprise the inclination of the needle was diminished about 48'."† And he goes on to say that in all the violent outbursts of volcanoes the earth-tremors are limited to a small area round about them. It is, however, far otherwise with earthquakes; they sometimes extend to great distances. This, as will be seen, is in direct opposition to Dr. Buist, and others named, who support the electrical theory. Baron Humboldt, although he could not trace any direct atmospheric disturbance at the time of earthquake phenomena, admits that the magnetic needle was considerably disturbed.

* *British Association Report*, 1855.

† *Cosmos*, v. i. p. 203.

We do not appear to have gained anything in *actual* knowledge as to the cause of earthquake phenomena since the time when Humboldt penned these lines. He says, "The intimate connexion of the phenomena which we have considered is still hidden in obscurity. Elastic fluids are doubtlessly the cause of the slight and perfectly harmless trembling of the earth's surface, which has often continued for several days together. . . . The focus of this destructive agent, the seat of the moving force, lies far below the earth's surface; but we know as little of the extent of this depth as we know of the chemical nature of these vapours that are so highly compressed." *

As observed by Mr. Rudler, it has been asserted that there are certain meteorological phenomena observable at or before the occurrence of earthquakes. I have heard the same stated myself; and to be on the safe side here, I wrote to the superintendent at the Physical Observatory at Kew, and on July 9th Mr. T. W. Baker, the assistant in charge, writes me: "I have looked over our magnetograph curves corresponding to the date you refer to, but I do not see any disturbance of an unusual character, in fact the traces only exhibit the ordinary daily range."

In connexion with this Mr. R. Mallet, in *British Association Report*, 1850, p. 71, quoting Von Hoff, says, "In many instances in which opportunity of observing the magnetic needle during an earthquake has presented itself, an alteration in its direction for the time has been observed. . . . More remarkable, however, are the changes in the direction of the dip and variation needles, which take place at a distance from the place where the earthquake was observed, and at a place where the shock itself is not perceptible. As, for instance, in Paris, on the 19th February and 31st May, 1822, simultaneously with an earthquake which occurred in Savoy and some of the north parts of France." Perhaps this shock was a more potent one, and extended further, than the one we experienced in this country, otherwise I do not see why the instruments at Kew should not have registered it.

On April 22nd, during the earthquake in Essex, the south current needles of the instruments at Greenwich Observatory showed a disturbance at 9.20 am.; but the horizontal magnets were not disturbed. At the Kew Observatory the magnetographs recorded the shock at 9h. 17min. 18secs., Greenwich mean time.

Whether earthquake phenomena are at all connected with

* *Cosmos*, v. i. p. 210.

the great physical disturbances on the surface of the sun has not been perhaps so thoroughly investigated as could be desired. Be this as it may, the year 1883 has been remarkable for both. The sun, as observed by M. Thollon, has been greatly disturbed. On July 22nd a long chain of spots was observed on the sun's southern hemisphere, extending from limb to limb. The arrival of this group was heralded by the appearance of a prominence of extreme brilliancy at 4 o'clock on the 16th. This phenomenon consisted of a number of straight jets, apparently diverging from the same point of the limb. Continuing his observation on the 21st and 22nd of July, the southern half of the sun showed evident signs of violent agitation. Spectroscopically, all the metallic lines were more or less affected by this great disturbance of the sun's disc.*

Notwithstanding that both Baron Humboldt and Mr. Rudler do not credit meteorology with having any connection with earthquakes, Dr. Gray, in his communication to the Royal Society on the earthquake on November 18th, 1795, says, "The state of the atmosphere that accompanied this phenomenon is scarcely less remarkable than the earthquake itself. In the night of the 17th, it had blown with some violence from the south-west; in the morning the gale increased, and at eleven o'clock it blew a tempest, accompanied with very dark dense clouds, and with a greater degree of warmth, or rather sultriness, than I ever recollect to have felt in November, when there was no sunshine. About midday there fell a heavy rain for an hour, after which the wind abated, the clouds dispersed, and at six o'clock it was a serene calm evening. At the moment of the earthquake it was perfectly still, and continued so at one o'clock in the morning, with the same degree of warmth that had prevailed in the day. At eight o'clock the following morning it froze intensely, and the ground was covered with snow."†

It is also recorded by the same gentleman, as he was informed, that "at the time of the earthquake a remarkable light and coruscation proceeded from the south-west quarter of the heavens. The sudden change of temperature, from the warm air to that of the ground covered thick with snow, suggested the idea that the earthquake was intimately connected with the electrical phenomena of the atmosphere."

In one of the numerous reports of the terrible earthquake at Krakatoa, the officers of the following ships report—that

* *Athenæum*, September 8th, p. 310, *partim*.

† *Transactions of Royal Society*, 1796, part I. pp. 370-71.

at 10 a.m. it was so dark aboard the steamship *London*, that not even the outlines of the ship or persons were visible; the needle of the compass was violently agitated, and the lightning struck the ship seven times; and the masts and yards were illumined by St. Elmo's fire.

Those on board the ship *Annersley* say that at 10 a.m., August 27th, it was so dark that they had to light all the lights, and the barometer was rising and falling from half an inch to an inch in a minute. (*Nature*, January 10th, 1884.)

A similar description to the above was given by the master of the *Charles Bal*, which was about thirty miles from the island when the eruption broke out.

Notwithstanding then what has been said by Baron Humboldt and others, we have here direct evidence of atmospheric phenomena, especially that of St. Elmo's fire, and the agitation both of the needle and of the barometric pressure.

A writer in the *Times* of Sept. 8th, 1883, p. 6, in which I think I trace the hand of Mr. Proctor(?) is comparing the structure of the moon with that of the earth, the moon being within easy telescopic distance, and having no atmosphere; or if it has, it is so extremely rarified that it forms no impediment to the investigator; we can therefore draw some analogy from the structure of the moon. The writer says, "The moon is dead, it has not life enough left to ooze forth the tiniest mud volcano, or spurt out the feeblest geyser; no throb ever reaches its surface, and not the faintest rumble is ever echoed from its jagged mountain sides. No earthquake wave can ever sweep its island shores; for earthquakes there are things of the almost infinite past, and the last drop of water quitted the surface of the planet æons ago. Its very atmosphere has deserted it; and if indeed there were 'a man in the moon' he could never hear the sound of his own voice. . . ." When the internal fires of our own earth have exhausted themselves, geologists say that we may look upon that as the beginning of the end. Not even the 600 degrees of heat of the sun, which beats upon every part of the moon for a fortnight at a time, is able to rouse within its bosom the faintest sign of life. We are told that our existing volcanoes and geysers and mud-holes are but the dying remains of what at the time must have been a volcanic activity, almost universal. Instead of spasmodic eruptions at a few isolated spots, we had a continual outpour of volcanic matters from wide fissures, extending across the earth's surface for many miles. We have, as every geologist knows, plenty of evidence of this in the various eruptive rocks, which were very

abundant in the early times of the earth's history; and we have, as the writer in the *Times* observes, only a few outbursts now, as compared with those of former ages; but two especially have occurred—the one at Ischia, and the other at Java, which brought so much destruction upon these places, and have taught us that the earth's fire is not yet extinguished.

The writer in the *Times* holds up a very dismal picture to our view in his comparison of the dead moon to our earth, and certainly if we are to draw an analogy from the condition of that satellite, our outlook is very far from a pleasant one. There is one consolation, however, to be drawn from this, and that is, *we* shall not be cognisant of it when that consummation arrives.

This writer goes on to say, "When the blood leaves the cold extremities, and the heart has not vigour enough to send it to the surface, the end is not far off; and when volcanic and earthquake manifestations cease from the face of the earth, the end may be within almost measurable distance—much of its ocean waters will have been absorbed by the underlying rocks, and the atmosphere may be rarer and less life-giving than it is now. So long then as the mother of us all has any vigour left, we must expect her to manifest it occasionally as she has done recently at Ischia and Java." From this point of view we may earnestly pray that Vulcan will keep his fires burning, if these be the life-blood of the earth; and if occasionally he should cause some disaster, it is better that than to die out altogether.

The earliest earthquake shock I can find recorded for England, and from its severity it probably extended to this part of the country—but this is by no means certain—was in 1089,* August 11th, third hour of the night. This was felt throughout all England.

Frequently earthquakes and earth-tremblings are very local, and others again are of wide extent. Of one that occurred on April 6th, 1580, it is said that it extended throughout England, and in the district of London especially, where the great bells of Westminster were made to ring.

December 29th, 1661.—This was felt in England generally; it was a remarkable year for earthquakes throughout all Europe, and they lasted with slight intervals the entire year.

July 12th, 1748.—Between 10 and 11 p.m.; direction S.E. to N.W.; shock felt at Taunton and English Channel to the

* MALLEY, *Brit. Assoc. Rep.*, 1852, p. 22.

Severn; this was also felt at Exeter and Crookhorne.—*Phil. Trans.* v. xlv. p. 398.

February 8th, 9th, 1749–50.—The Rev. Wm. Barlow writes to the President of the Royal Society on the shock of an earthquake felt at Plymouth: "Sir, it is proper to observe that the following relations are not made by mean, ignorant, or fanciful people, but by persons of good sense, whose veracity is unquestionable, and whose judgment in this case is, I think, rational and just.—WILLIAM BARLOW."

The first witness to the above shock is a declaration of the Hon. Philip Vanbrugh, Commissioner of His Majesty's Dockyard, near Plymouth; he was reading in bed, and was sensibly affected by a sudden shake.

We have also a declaration from Mrs. Vanbrugh, sister of the Commissioner, and of Mr. Slade, master shipwright of His Majesty's Dockyard, and Mrs. Slade.

The year 1750 appears from the various reports to have been famous for earthquakes, even in England, as several are recorded; and one especially, which was very severely felt from London across the country northwards.

February 23rd, 1752.—Dartmoor and the neighbourhood was visited by an earthquake. "A smart shock, which was felt in many places on the Moor, and in its immediate neighbourhood—Manaton, Moretonhampstead, and Widdicombe. In the last named village some houses were injured, and one of the pinnacles of the church was thrown down."—Mrs. Bray's description of this part of Devon, in *Borders of the Tamar and Tavy*, v. i. p. 310, ed. 1836.

July 15th.—A shock of rather a severe character was experienced in the Scilly Isles, at St. Mary's. From this it seems to have travelled, but diminished in force, to Plymouth; it was felt at all the intermediate places in Cornwall. On the strand at Penzance unusual marks were observed in the sand at 10 o'clock a.m., where it was generally quite smooth. A space of 100 square yards was covered with little elevations like mole-hills, with holes in their tops, as if something had issued thence. From one of these depressions a jet of water of the size of a man's wrist issued, a phenomenon never before observed or afterwards.

November 1st, 1755.—The great earthquake at Lisbon; the effects of which were felt by the agitation of the sea, the lakes, and the ponds of water. The sea rose at Dartmouth after nine o'clock above the highest tides, retaining this height for three-quarters of an hour. At Plymouth about 4 p.m. (the time of high-water) the sea retired,

and then came back in eight minutes, in each case to the extent of six feet; the ebbing and flowing continued for some time. (MALLET, *Brit. Assoc.* 1852, p. 169.)

The Rev. Mr. Holdsworth, of Dartmouth, in a letter which was communicated to the Royal Society, and published in their *Transactions*, vol. xlix. part 2, 1756, p. 643; said it was observed by the pilots at the above place, that at "9 o'clock a.m. there was a surprising agitation of the waters, and though there was but little wind, yet boats riding near the mouth of the river tumbled and tossed about as if they would leap into each other. During this fermentation [or boiling of the sea like a pot, as my informant expresses himself], though it was four hours' ebb, the waters rose as high or higher than they usually do on the highest spring tides. This violent motion lasted about three-quarters of an hour."

This agitation of the sea was observed at Plymouth, Mount's Bay, Penzance, &c. In a letter of John Huxham, M.D., F.R.S., to Mr. William Watson, F.R.S., he says: "On Saturday, November 1st, about 4 p.m., just about high-water, we had an extraordinary boar, as the sailors call it. The sea seemed disturbed about twenty minutes before, though there was very little wind that day or for some days before. . . . When I came home one of our surgeons, who had then just crossed the ferry at Oreston, a mile to the south-east of Plymouth, told me that the tide had made a very extraordinary out [or recess] almost immediately after high-water, about 4 p.m.; left both the passage-boats, with some horses and several persons, at once quite dry in the mud, though a minute or two before they had four or five feet of water. In less than eight minutes the tide returned with the utmost rapidity, and floated both the boats again, that they had near six feet of water. The sea sunk and swelled for near half an hour longer." This agitation of the sea was not confined to our own coasts, but was observed in Holland, Germany, Ireland, &c. At Portsmouth it occurred at 11 a.m., and Holland 11 a.m.; at Kinsale, &c., not till 3 or 4 p.m.

We have then a very long letter from the Rev. W. Borlase, A.M., F.R.S., to the Rev. Charles Lyttleton, LL.D., Dean of Exeter, on this same disturbance of the sea. He says that "a little after two o'clock in the afternoon, the weather fine and calm, barometer at the highest, thermometer at fifty-four, the little wind there was being at north-east, about half an hour after ebb the sea was observed at the Mount Pier to advance suddenly from the eastward. It continued to swell

and rise for the space of ten minutes ; it then began to retire, running to the west and south-west with a rapidity equal to that of a mill-stream. . . . The sea then began to return, and in ten minutes it was, as before mentioned, extraordinary high ; it ten minutes more it was sunk as before."

There can be little doubt but this rising and falling of the sea, as above described, was the effect of submarine disturbance, probably at no great distance from our shores. At the same time we know, from the reports of the earthquake which occurred on the coast of South America, that the waves there rose to an enormous height, so as to carry ships up high and dry far inland. The waves caused by this earthquake were rolled across the seas to the shores of New Zealand.

February 27th, 1756.—The Rev. Mr. Prince, of Barnstaple, in a letter to the Rev. Jeremiah Milles, who read the letter to the Royal Society, writes : "On Friday, the 27th February, at Ilfracombe, at six in the evening, the weather being extremely fair, as it had been for some time before, the sea being exceedingly calm, a rumbling noise was heard like that which usually precedes what sailors call a ground sea, only it was much louder. The tide at the time was above half ebb, and retired as far as the head of the quay, leaving the vessels within the pier on dry ground, when on a sudden the sea came on with a great run, filling the quay to the height of six feet perpendicular ; and the water remained at the same height near half an hour, but all the time was agitated as in a storm." (*Ibid.* p. 642.) This was one of the most active years for earthquakes ; no less than 104 are recorded by Mr. Mallet as occurring in different parts of the world.

July 15th, 1757.—Violent shocks of earthquake were felt at St. Mary's in the Scilly Islands, and were strongly felt in both Cornwall and Devon. The shocks occurred at 6.15 p.m., and lasted from six seconds to half a minute. (*Phil. Trans.* v. i. p. 2.)

In some of the Cornish mines this earth-wave was very perceptible, and a noise like the roll of thunder or of heavy waggons in motion was heard, in the 18 to 70-fathom levels.

July 28th, 1761.—An extraordinary agitation of the sea was observed in Mount's Bay, Fowey, and at Plymouth ; but no land shock was experienced. (MALLET, *Brit. Assoc.* 1853, p. 142.)

August 19th, 1763.—A great disturbance of the sea occurred at Plymouth about noon—a sudden flux and reflux of the tide, similar to that caused by the great earthquake that

occurred at Lisbon. At the same time a tremendous storm of thunder and lightning was raging overhead.

1774.—“On October 25th, about ten o'clock in the evening, a slight shock of an earthquake was felt in this city (Exeter). Its direction seemed from south to north. The tremulation of the earth lasted about two seconds, and greatly alarmed several families, particularly that of Colonel Newton, in James Street, where several doors were thrown open and the house-bells rung by the shock. It was also felt at the houses of John Short, Esq., and Mr. Gibbs, surgeon, near Palace Gate.” (JENKIN'S *History of Exeter*, edit. 1806, p. 218.)

September 8th, 1775.—A shock of earthquake was felt at Barnstaple at 9.55 in the evening. This notice was kindly communicated by John Chanter, Esq.; extracted from a note-book of an ancestor of his.

May 3rd, 1809.—Barnstaple was alarmed by a shock of earthquake, which travelled from east to west, and lasted about one minute. It was accompanied with a rumbling sound.

May 31st, 1811.—“The sea rose on all the southern coasts, Cornwall as well as in Plymouth, from four to eight feet perpendicularly. Mr. Luke Howard states that at Plymouth it began at 3 a.m. and continued until 10; that at 6.45 the sea rose eleven feet.” (*Edin. Phil. Trans.* vol. xv. p. 618.) Mr. Howard records another disturbance of the sea a few days afterwards; namely, June 4th, at 4 o'clock, at Plymouth. This was also observed at Mount's Bay.

October 20th, 1837.—Liskeard and the country round, as also in Devon. “This was accompanied by a sound like the rattling of a cart.” (*Royal Cornwall Gazette*, November 3rd, 1837.)

October 27th.—Several shocks were experienced at Camel-ford and a dull noise heard. This, although so near, is not recorded for Devon. (*Colla. Giorn. Astron.* 1839, p. 112.)

November 24th.—It is thought that some confusion has arisen as to the date, and, as Mr. Mallett observes, the one above may really mean this one. (*Brit. Assoc. Rep.* 1854.)

September 2nd, 1839.—Bristol, Newport, Cardiff, and all the West of England, were shaken by this rather severe shock.

July 5th, 1843.—An extraordinary oscillation of the sea at 11 a.m. was observed at Plymouth and Penzance.

October 30th, 1843.—A similar movement was recorded at both the above places by Mr. Edmonds in *Report of British Association*, 1845. The master of a vessel estimated the velocity of the wave as travelling at eight knots an hour.

May 23rd, 1847.—Another great agitation of the sea. It was noticed in Mount's Bay at 5 a.m., but it seems to have reached its maximum at Plymouth between 8 and 9 p.m. (EDMONDS'S *Land's End District*, p. 82.)

April 2nd, 1858.—"A shock of an earthquake was felt at Plymouth and in Liskeard." (EDMONDS'S *Land's End District*, p. 116.)

September 28th, 1858.—Mr. G. Wareing Ormerod says, in a paper published in the *Proceedings of the Geological Society of London*, 1858, p. 188: "On the evening of Tuesday, the 28th September last, a slight shock of an earthquake was felt in the district adjoining the northerly edge of Dartmoor, and it appears to have been almost entirely confined to the vicinity of the junction of the granite and the Carboniferous rocks. No vibration of the ground was then felt; but a rumbling noise was heard, attributed at the time to a supposed explosion of the gunpowder mills on Dartmoor."

At Druid (Ashburton), on the Devonian beds, near the edge of the granite, about a mile to the north-west of Ashburton, a rumbling noise like that caused by a carriage passing over gravel was heard.

At Moretonhampstead, on the granite) about a mile and half from North Bovey, no motion was felt, but a sound resembling the roar of a furnace was heard. At a farm, on the granite, about half-way between Moretonhampstead and Chagford, the farmer heard a sound, and mistook it for the noise of a cart that was expected; he rose from his supper, lighted his lantern, and went out to meet it.

At Chagford, on the granite, both sound and motion were noticed, and Mr. Ormerod's attention was withdrawn from writing by a low rumbling sound. This shock was also heard and felt at Tintcombe and Drewsteignton. The sound was heard at the "Dartmoor Inn." The shock appears, from the direction in which Mr. Ormerod traced it, to have made almost a circuit of the moor, and its line of action was the junction of the granite and the Devonian and Carboniferous rocks.

June 25th and 26th, 1859.—Very considerable oscillations of the sea occurred in Mount's Bay, Falmouth, Fowey, and Plymouth. (EDMONDS'S *Land's End District*, p. 86.)

October 4th, 1859.—"An extraordinary oscillation of the sea was observed in Mount's Bay. At St. Mary's, Scilly, there was eleven feet of water on the tide gauge at 7 a.m. It then fell to nine feet without a stop. It began to rise, and in six minutes there were fourteen feet seven inches on the gauge. It made no stop, but kept ebbing and flowing. At Plymouth

in the afternoon the agitation of the sea was very great." (*Ibid.* pp. 88-91.)

At Barnstaple bay and Appledore, pilots observed the tide to return seven times.

October 6th, 1863.—A rather severe shock of earthquake was felt, extending from London to Liverpool and the borders of Wales. A line drawn through from Liverpool, Derby, Wolverhampton, Birmingham, and Hereford, to Taunton and Exeter would seem to mark the course along which the shock travelled. The shock or shocks, for some experienced two, occurred as near as can be ascertained about 3.20 to 3.30 a.m. In several instances, the beds on which persons were sleeping rocked to such a degree that the sleepers were awakened; whilst others were aroused by the shaking and rattling of articles of furniture. In one case, a person who was leaning out of bed to reach something from a table was thrown upon the floor. The police on duty felt the shock very much.

At Exmouth, Budleigh Salterton, and Newton Abbot many of the inhabitants were awakened from their sleep. Mr. Hine of the "Feathers Inn," Budleigh Salterton, heard a crash, and on going down found that two bottles of brandy had been dislodged from the shelf and broken. This shock was also felt at Axminster, Honiton, Sidmouth, Clyst Hydon, Southmolton, and Barnstaple, and at the Duchy Hotel, Princetown. (*Devon Weekly Times*, Oct. 9th, 1863, *partim.* p. 5.)

We have also a record of this earthquake, kindly furnished by Mr. Ormerod from his journal. The shock was distinctly felt by the servants of the rectory at Chagford; the doors and windows shaking, and a noise heard like papers being drawn along the floor. At the "Three Crowns Inn" there the inmates were so disturbed that they got up; and a Mr. Palmer heard a "rouse and rumbling like." At Mr. Berry's the servants asked in the morning for some wedges to fasten the windows, they shook so. At Sidbury Park, near Chepstow, the shock was felt by one of Mr. Ormerod's sisters, at 3.30 a.m.

October 5th, 1866.—Mr. Ormerod felt a shock of earthquake at Chagford; it occurred at 8.55 p.m.

October 30th, 1868.—A shock of rather a severe character was experienced in Exeter and neighbourhood. At Rose Mount Villas, on the Polsloe-road, on a thick bed of Trias brick-earth, of which this ridge is chiefly composed, it was severely felt; also in York Buildings, Mount Radford, and in Dix's Field. In York Buildings a house trembled so much as to alarm the household. The bells shook and rung. The

lady of the house having lived many years in the West Indies recognised the tremor and peculiar sensation as that of an earthquake. At the Eye Infirmary, in Magdalene Street, Exeter, the inmates were much alarmed by the shaking of the building. At the Devon and Exeter Institution the writer of this heard an unaccountable noise, and his servant who had just gone to bed, at 10.30 p.m., said that it seemed to her as if the bed was being carried over to the other side of the room. As the bedstead was standing with the head N.N.E., the probability is that the earthquake wave travelled from east to west.

This same shock was felt at Chagford Rectory, but the time there stated was 10.40 p.m. There may have been some difference in the time kept by the clocks or watches between Exeter and this place. Mrs. Hames was in her bedroom with her maid-servant, and the governess said she felt the table shake. The Rev. H. Hames, who was in his drawing-room, said the shock passed from N. to S. (magnetic) with a crash.

August 29th, 1869.—A shock of earthquake was felt to the south-east of Exeter at 1 p.m., accompanied by a low rumbling sound. At 1.15 p.m. the same day a similar noise was heard, but no shock felt.

August 26th, 1871.—A shock was felt by Mr. G. W. Ormerod at his residence, Brookbank, Teignmouth, at 4.25 a.m.

April 14th, 1873.—A shock was felt along the south coast from Dawlish to Sidmouth, and the intermediate stations. It probably extended further, but I could not obtain the information to that effect. A gentleman residing on the high ground at Budleigh Salterton, described in a letter to me the shaking of the shutters of his house for the space of eight or ten seconds; and said had it continued longer he should have rushed out of the house. Many of the shopkeepers' shutters rattled so much that they went out to see if someone was not trying to take them down.

A correspondent, "S. C.," in the *Western Times* of the 18th, describes the shaking of the windows of the house at 17½ minutes to 10 p.m. on Monday, April 14th. Other persons in the house heard the noise and came downstairs.

Another correspondent, in the *Daily Western Times* of April 19th, reports a peculiar ripple of the sea which was observed by several persons on Tuesday morning, the 15th. The ripple appeared to be about fifty yards in length and about the same in breadth, and about the same distance from the shore, opposite Maine Place. Some fishermen said they never saw such a peculiar motion of the sea before, and

thought it was produced by the rising of a bank and the uncovering of rocks before covered by sand.

A friend residing at Kenton, who with his wife and family were sitting by the fire, describes a rumbling noise as if an iron bedstead had been drawn across the room overhead, the windows at the same time shaking. The master and his wife and servant at the Idiot Asylum, Starcross, were greatly alarmed, at 15 minutes to 10 p.m., by hearing a loud noise, so much so that they feared the whole building was coming down about them. This was in the old building facing the sea, and not the present Idiot Asylum, which has been built since.

The butler at Powderham Castle, the seat of the Earl of Devon, heard, as he described it, a noise like thunder, and went out into the garden to convince himself, but found a perfectly clear sky. A lady also in that neighbourhood, namely, at Mamhead, heard a noise resembling thunder at a quarter to ten. Another friend residing at Starcross described to me the noise he heard. Every window in his house rattled; there was no wind, it was perfectly calm, and he at once came to the conclusion that it was an earthquake. The time, on comparison, agreed with the others, namely, a quarter to ten p.m.

May 6th, 1883.—Mr. G. W. Ormerod very kindly extracted this from his Journal for me: "At 5.55 Greenwich time a shock of earthquake occurred at Teignmouth; it was like the discharge of a gun. Felt at Dr. Lake's in Bitton Street, near the Teign; the house stands on the New Red Sandstone. The noise was also heard by Johnson the waterman, and by Mr. Rudkin, L.K.Q.C.P., who was sitting in his chair; he went into the front room to see what had taken place. Mrs. Browne, at Westerland, in the New Road, felt a shake."

June 25th, 1883, occurred the most noticeable earthquake that has happened for many years, and one which embraced a wider area than the generality of the shocks which occur in this district. The Rev. R. H. Manley, writing from Stokeclimsland Rectory, says, "Unless I am greatly mistaken, we have just experienced two earthquake shocks in this parish. The first, which seemed to last about three seconds, occurred about 1.35 p.m.; and the second, which passed more quickly, about 2.10 p.m. The noise was like that of a heavy waggon rumbling along a hard and rough road. This house, a large and substantial one of stone, shook very perceptibly. Some members of my family were in the church when the first shock was felt, and report that the

church was shaken, and the lamps hanging from the roof, from which in winter coronas are suspended, oscillated for some minutes."

The correspondent of the Plymouth *Mercury* at Tavistock says, "A slight shock of earthquake, which appeared to be travelling from north-west to south-east, was felt in the town of Tavistock yesterday afternoon at twenty-two minutes to two o'clock p.m. The shock caused great surprise to many of the inhabitants, and was more distinctly felt in some of the oldest houses. The inhabitants of Princetown and its vicinity about two o'clock in the afternoon were somewhat affrighted by two smart shocks of the earth, followed by a subterranean rumbling, which they compared to the passing of a very heavy waggon, or the echo of distant thunder."

At Holsworthy the shock was felt at 1.36 p.m. Houses were shaken to their foundations, and furniture oscillated and rattled considerably. Much excitement was manifested, people rushing out of their houses, and making anxious enquiries as to the strange occurrence. The atmosphere at the time had a tendency to thunder. The shock was felt at Torrington; and at Okehampton it appears to have been severe. From this it seems to have extended eastward; and at Rochside, near Sticklepath, the seat of Mr. W. W. Symington, his men, who were at work under a long shed roofed in with sheets of galvanised iron, were startled by the noise made. At the Devon Great Consols Mine the men working in the 180 fathoms level were much startled by the quivering or shaking of the ground. It appeared to them that the various workings were falling together.

This earthquake was also felt at Bideford, Hartland, Clovelly, and Buckland Brewer. At Clovelly a gentleman who was writing was unable to proceed, through the vibration. The Bideford postman, who was standing near a cupboard in a house, was surprised all at once at the rattling of the china within.

Mr. Sherry, cabinetmaker, Exeter, who was on Dartmoor with a party of friends, says that he was in the valley near Bratton Tor between 1.30 and 2 o'clock; his friends were on the top of the tor. Suddenly he heard a loud sound like the rumbling of heavy artillery travelling on a hard road. The sound approached him from the north, and appeared to pass away to the south, lasting, as near as he could judge, about twenty or thirty seconds. The trembling was comparatively slight in the valley; but on the summit of the tor, his friends were standing on a large block of granite,

the ground beneath their feet quaked to such a degree, and so alarmed them, that they fled as fast as they could run. For thirty-six hours before this occurred the weather had been very wild on the Moor; but at the time of the earthquake the clouds had cleared away, and the sun was shining brilliantly.

At Hatherleigh, at about 1.40, a gentleman was sitting quietly after dinner, when all at once a low rumbling sound was heard, accompanied by a tremulous motion, slightly heaving, the crockery rattling perceptibly. This lasted about three seconds.

It does not appear that this earthquake was so much felt on the south side of the county. At the same time it was felt at Sidmouth, Exeter, Teignmouth, Ashburton, and Plymouth.

A writer in the *Western Morning News* says of the direction of the shock or shocks, and the area covered by them: "It would seem that, striking the southern coast of Cornwall, this travelled in a north-easterly direction, and affected a large area, extending at least from Lostwithiel on to the west to Ashburton on the east, and from the English to the Bristol Channel. The whole valley of the Tamar lay in their path, but the Three Towns seem to have been outside it." The chief places in Cornwall where the shocks were felt, so far as I am able to ascertain, are Padstow, Bude, Liskeard, and Lostwithiel.

On Tuesday, April 22nd, 1884, at 9.15 to 9.20 a.m., occurred the most severe shock of earthquake at Colchester and the whole district around, and reaching to various parts of London, Bury, Leicester, Bath, &c., and to the French coast at Boulogne. This proved to be the most destructive to property of any earthquake wave recorded in this country. Some described the shock as having a vertical motion, and others as both vertical and horizontal, with an undulatory motion. This latter is probably correct, and as such it was described to me by Dr. D. Kingdon. He informed me that a friend of his, a very sensitive lady, was lying down on a couch, and says that she experienced a peculiar sensation as of a movement of the earth. This was in the neighbourhood of the city of Exeter.

I have in this paper enumerated thirty-three earthquake disturbances, either of the sea or of the earth. There may have been more, but I cannot find that they have been recorded. According to M. Perry's researches into seismic

action, he comes to the conclusion that the shocks are more frequent at the time of the equinoxes than at other times, and especially at the summer solstice; but according to the researches of Mr. Mallet, after examining the evidence recorded of earthquakes from two thousand years before the Christian era down to the year 1850, the alternations of paroxysm and of repose appear to follow no absolute law deducible from these curves (referring to plates of curves in Report of British Association, 1858). He goes on to say that "two marked periods of extreme paroxysm are observable in each century—one greater than the other—that of greatest number and intensity occurring about the middle of each century, the other towards the end of each. This is one of the most remarkable facts that these curves seem to point to. From about the fiftieth to the sixtieth year of each century both the number and intensity of earthquakes will be observed suddenly to shoot up. Again during the last quarter of the three complete centuries another, but less powerful, paroxysm is apparent." This would seem to contradict what Mr. Mallet had just advanced, that no law for these disturbances could be deduced from them. At the same time they appear to be governed by a law not yet defined. Again, M. Perry's researches led him to the belief that seismic action was more active at the summer solstice than at any other period of the year. But this applies more to the northern hemisphere than to general distribution. In Mr. Mallet's researches, which include the whole globe, he found that at the vernal equinox (March 10th to 30th) there were 310; summer solstice (June 11th, July 1st) 254; autumn solstice (September 13th, October 3rd) 249; and winter solstice (December 11th to 31st) 318. From this, the largest number of observations that has ever been collected together, it is found that it is at the vernal and winter equinoxes the greatest seismic energy is developed. In our own—and I fear very imperfect—catalogue of earthquakes in Devon the greatest number occurred in July (*viz.*, 6) and in October (8). Mr. Mallet observes, after taking into consideration the researches of M. Perry and others, "We cannot put aside the possibility that the fact may have a cosmical origin." But what that really is remains a problem yet to be solved.

It has been suggested that earthquake shocks traverse the crust of the earth along the junctions of the older rocks; but this is scarcely borne out by experience, and, so far as our own county is concerned, the Triassic rocks are made to vibrate with the shocks quite as much as those of earlier

date. In early times, when seismic forces were more active than at present in the British Isles, advantage appears to have been taken of the junction of the older rocks, being perhaps the weakest part, as it is on these lines that we find the most and largest of the eruptive masses of Trappean rocks. Of these we have many very excellent examples in Devon, such as Beleston, Rougemont, Exeter, Pocombe, Brent Tor, &c., and other eruptive rocks; and not as the Greenstones, which appear to have followed no lines of junction, but have been intruded into cracks and fissures occupying a wide area round the granite rocks of Dartmoor.

Having thus collected all the information I can concerning earthquakes in Devon, from the earliest to the present time, that I have been able to find recorded, and from the observations and experience of friends, and also from my own notes, I will conclude this paper with a forcible paragraph from that great practical physicist and excellent observer—Baron Humboldt, who thus speaks of the trembling earth: “We are accustomed from early childhood to draw a contrast between the mobility of water and the immobility of the soil on which we tread; and this feeling is confirmed by the evidence of our senses. When, therefore, we suddenly feel the ground move beneath us, a mysterious and natural force, with which we are previously unacquainted, is revealed to us as an active disturbance of stability. A moment destroys the illusion of a whole life; our deceptive faith in the repose of nature vanishes, and we feel transported, as it were, into a realm of unknown destructive forces. Every sound—the faintest motion in the air—arrests our attention, and we no longer trust the ground on which we stand. Animals—especially dogs and swine—participate in the same anxious disquietude; and even the crocodiles of the Orinoco, which are at other times as dumb as our little lizards, leave the trembling bed of the river and run with loud cries into the adjacent forests.”* This very graphic description, by one who had had perhaps more experience in his day than any other we could name, is fully borne out by those whose experiences have been far less, who, when reflecting on this globe of ours, feel that we are in reality living on an elastic ball; and that the pent-up forces of the interior will, from some cause yet unexplained, rend and tear the crust on which we tread, causing devastation and ruin to some of the most prolific and loveliest spots on the face of the planet.

* *Cosmos*, v. i. p. 204.

As to the conflicting theories that have been promulgated on the extraordinary brilliant sunsets and sunrises which began in October last, and continued with more or less interruption and brilliancy to the middle of January of the present year, the majority of the theorists have attributed the phenomena to the outburst of the volcano at Krakatoa, having projected the volcanic dust into the higher regions of the atmosphere, on which the rays of the sun have acted, and reflected the various and wonderful colourings which have been seen all round the globe. What appears to confirm this theory is the observation made by Mr. Whimper, on his ascent of Chimborazo, during an eruption of Cotopaxi. He says, "We saw a green sun, and such green as we have never either before or since seen in the heavens; we saw patches or smears of something like verdigris-green in the sky, and then they changed to equally extreme blood-reds, or to coarse brick dark reds, and they in an instant passed to the colour of tarnished copper or shining brass. Had we not known that the effects were due to the passage of ash, we might well have been filled with dread instead of amazement."* Another circumstance which appears also to confirm the dust theory is the following: "A remarkable shower of white sulphurous ash fell in Glen Grey, about twelve miles from Queenstown, in the Cape Colony, towards the close of November. It was composed of little balls of white matter, which glistened in the sun; the fall alarmed both natives and the white population."† This would seem to be almost sufficient evidence to substantiate the fact that it was volcanic dust which contributed to the brilliant colouring so universally admired; at the same time it is remarkable that it should remain so long, and that the dust should not fall to the earth, but remain suspended in the higher regions of the atmosphere for so considerable a time. To counteract this we have a theory propounded by Mr. A. C. Ranyard, embodied in an article in the *Contemporary Review*, January, 1884, p. 149, by Mr. Proctor, who says, "As to the actual cause to which both phenomena are to be ascribed (the green and blue sun), we must, I think, exculpate Krakatoa from all part or share in producing these strange effects. The appearance of a blue sun at Trinidad, followed two or three days later by a green sun in the East Indies, cannot possibly be associated with the occurrence of an earthquake on the Java shore a few days earlier. We seem obliged then

* *Nature*, December 27th, 1883, pp. 199-200.

† *Times*, January 8th, 1884, p. 2.

to support a theory, first advanced, I believe, by Mr. A. C. Ranyard, that the phenomena were caused by a cloud of meteoric dust encountered by the earth, and received into the upper regions of the air, thence to penetrate slowly (mayhap not till many months have passed) to the surface of the earth.* Mr. W. P. Marshall, in the *Midland Naturalist*, says, "It has been suggested that the erupted lava (at Krakatoa) was projected into the atmosphere in the form of minute hollow-glass vesicles, such as may be supposed to be produced by a sudden discharge of very high pressure steam through a layer of melted lava." But several independent observers far in the interior of Australia, who knew nothing of the eruption that had taken place, nor had heard of the theories propounded, related, however, that showers of a peculiar dust had fallen all over the land of their own respective districts, confirming in this manner the theories that the colours were produced by dust; but whether meteoric or projected into the atmosphere by the volcanic outburst of Krakatoa has not been decided.

In a long and interesting article on "Les Rougeurs du Ciel," by M. J. Jamin in the *Revue des Deux Mondes*, March 1st, 1884, pp. 161-182, reviewing the various letters which have appeared in the journals, M. Jamin at length adopts the views of the majority of writers, that these brilliantly coloured skies were due to the volcanic dust projected into space from Krakatoa.

* January, 1884, pp. 1, 2.

HIGHWEEK : GLEANINGS FROM A PARISH CHEST.

BY THE REV. S. G. HARRIS, M.A.

(Read at Newton Abbot, July, 1884.)

It has been remarked that a satisfactory history of a country must be based, in great measure, on an accurate acquaintance with the history of particular localities. At all events, it will be admitted, that a knowledge of local circumstances will often throw light on the history of a country; and some acquaintance with each will often, sometimes unexpectedly, afford important help towards our knowledge of the past. Some light will arise from an acquaintance even with the contents of a Parish Chest; of course, in some places much more than in others. I am not about to claim any special importance for the place with which I happen to be connected, or for the contents of its Parish Chest; but I shall be pleased, if my attempt should induce others to search for antiquarian and other treasures in their Parish Chests, in places more intimately connected with the history of their country. But it may be interesting to note that even in the Parish Chest which is under my special care, the very first record in the earliest Register Book, curiously illustrates the history of the period referred to. The record is this:

"Hugh Parsons, weaver, is sworne and allowed to bee Register of the Parish of Highweeke. 23^d of January 1653

"Tho^s Reynell, J."

It will be remembered that this date was within the period of Oliver Cromwell's rule, and that during his time not only was the public use of the Book of Common Prayer forbidden, but persons were not permitted to be married in their Parish Churches; unless indeed (which I cannot verify) Justices of

the peace, before whom persons desirous of marrying were directed to appear, performed their functions in the Churches. There was a Publication of *Banns* at that time at the close of morning service. In 1654 I find the following entry :

"Sep. 8. An agreement of marriage between — Putt, the sonn of John Putt of this Parish upon the one Party and Joane Lowe, the daughter in law of John Parsons of the Parish of Highweek the other party was delivered unto me and was published on three severall Lord's Days in the close of the Morning exercise and noe objection against it."

And in the same year the following record of the marriage of the same parties :

"October the 17 day the said — Putte and Joane Lowe wher married before Thomas Reynell, esquire, justice of the Peace.
Tho^r Reynell."

This Thomas Reynell, no doubt, lived at Forde House, near the Newton Abbot Railway Station, which the Members of the Devonshire Association will have an opportunity of visiting. The Earl of Devon, the present proprietor, is the representative of a branch of the Reynell family.

In the same Register Book I find, in the years 1654-1658, some eighteen similar entries of Publications of Marriage similarly worded, and the Marriages taking place generally before Justices of the peace, mostly Thomas Reynell, Esquire, but in one case before Mr. Mayor "of Totnis;" and in 1657 and 1658 (as recorded) "by me, Francis Moore, Curatt of this Parish." After 1657 there is no mention of a marriage as taking place before a Justice of the Peace, but the Minister of the parish marries the parties. It was in the year 1658, it will be remembered (on September 3rd), that Oliver Cromwell died, and the country was handed over for a short time, until the Restoration, to the weak hand of his son Richard. This Francis Moore was the Curate of Highweek who preached the Funeral Sermon of Mrs. Mary Forbes, at "Bovitracy," in 1656, which forms the subject of a Paper by Mr. Pengelly in the *Transactions of the Devonshire Association* for 1882; he is mentioned also in the Marriage Register Book in 1659. He would appear to have been one of the intruded Ministers, put in during the Cromwellian period, or at least permitted to remain by the "Triers," to whom Cromwell entrusted the right of ejecting the clergy from their Benefices and Curacies. In 1659 the mention of the "morning exercise" is omitted in the record of the "Publications" in church of intended Marriages. In 1660, the year of the Restoration, and hence-

forward, marriages are entered in a simple form, without any mention of "Publications" of an intended marriage.

I here insert some notices which I have extracted, in the course of my search among the older Registers, which may prove of interest, in an antiquarian point of view, particularly to persons acquainted with the locality. The modes of spelling will be of interest to some, and will illustrate the indifference of our forefathers on the subject of accuracy in that respect:

In 1660 "two daughters of Walter Yard, Esq., were married."

In 1673-1678 are sundry entries of marriages in Latin—"nupti sunt," "conducti fuere." On the same page, and near it, are the words, "married," "maryed," "maried," "married."

In 1683. "Sir Henry Carew of Haccomb, Barronett and Madam Katherine Fowns were married, Jan^r 3^d."

In 1695. "John Briant minister & M Jane Segar ware married, October the 8th."

"Gilbert Yarde Esq and Joan Blackaler ware married January the 17th, 1694."

"Gideon Maynard of Cornwood in the County of Devon, Gent & Mrs Elizabeth Yarde of Bradley ware married in Psh Church of Highweek the 12th day of April in the year 1697."

BURIALS.

In 1654. "Waltar Yard, Esquire, buried May 28th day."

1655. "Waltar Yard, Gentellman, buried November 14."

1657. "Robert Yarde, Gent, buried January 27."

1668. "Mrs. — Yarde the wife of James Yarde Esq, January 3^d."

1670. "James Yarde, Esq, buried September 6."

1671. "Gilbert Yarde, Esq, buried, August 18."

1673-1677. Sundry entries of burials in Latin.

In 1691. "Gilbert Yard, Esq, buried January 7th."

1697. "Mr. Robert Northleigh,* Buried March 15, an affidavit brought, signed by Rich Gray."

[N.B.—The first mention in these Register Books of an affidavit, but no mention is made of the subject of the affidavit.]

In 1698. "Born, Gilbert y^e son of Gilbert Yard, Esq.

"Jean y^e daughter were born 18th of July."

"Gilbert y^e son of Gilbert Yard Esq was baptized y^e 2^d of August 1698."

"Joan y^e daughter of Gilbert Yard Esq was baptized y^e 4th of August 1698."

* A daughter of Henry Northleigh, of Peamore, was married to a Gilbert Yarde.

1700. "Buried Elizabeth Yard, Gent."
 1701. "John the son of Gilbert Segar."
 "M^{rs} Ann Bond, Widdow."
 "M^r William Yarde buried."

1713. At the end of an old Register Book, Burials, Baptisms, and Marriages are curiously intermixed.

In 1713. "Elizabeth y^e daughter of y^e Reverend M^r. Walter Stephens & Elizabeth his wife baptized October 8th.

1713. "Christopher Coyle & M^{rs} Judith Avant* married September 14.

1714. "John & Jane y^e son and daughter of John Bourne Curate and Sarah his wife buried, April 8th."

1714. Mention of *burials*, with *affidavit*, first *expressed* in the Highweek Registers; *i.e.* no doubt, of burial in flannel, and continued down to 1814.

In 1717. "Burial. Amy Baker, a stranger."

From 1713 the Registers are signed yearly for many years by the Minister and Churchwardens.

BAPTISMS.

Two entries in 1653.

Thirty entries in 1654 (including that of "Gilbeart the son of Gilbeart Segar").

In 1657. Entry of Baptism of "William Segar, Gent."

1658. "Jaune the daughter of M^r. Gilbert Segar, late deceased, was baptized March 5th."

1659. "Jaune the daughter of James Yarde, Esq, was baptized."

1660. "Thomas the sonne of William Yarde, bapt. July 26."

"John the sonn of William Segar, Gent. bapt."

1664. "Elizabeth the daughter of James Yarde Esq, Baptized."

1665. "Gilbert the sonne of James Yarde Esq baptized."

1672. "Gilbertus Gilberti Yarde armigeri filius natu maximus natus 17^o die Februarii Baptizatus 6^o die Martis Anno Domini 1672."

From 1672 to 1680 the entries of Baptisms are in Latin, with one or two exceptions.

In 1674. "Elizabetha filia Gilberti Yarde armigeri, bapt. Julii 17."

1675. "Henricus filius Gilberti Yarde arm. bapt. Augusti 26."

"Jane filia Gilberti Yarde baptizata Januarii 18."

1677. "Jacobus filius Gilberti Yarde Armigeri baptizatus," &c.

* In 1696 was buried at Chudleigh, as testified on a floor-stone on the south side of the Chancel of Chudleigh Church, Stephen Avant, "artium Baccalaurei, nuper Evangelii apud Highweek in hoc agro Devon concianoris —Philippi Avant, vic de Salcombe ac Gymnasiarchæ Chudliensis filii unici."

1679. "Thomas Gavericke * the son of John Gavericke was baptized September y 22^d."
1682. "James y^e son of Gilbert Yarde Esq was baptized May y^e 18th."
1685. "Samuell Gavericke y^e son of John Gavericke was baptized y^e 27 February."
 "Walter son of Gilbert Yarde Esq was baptized March 23."
1686. "Thomas y^e son of Gilbert Yarde Esq," &c.
1688. "John sonn of Bartholomew Galle, minister, baptized March the 7th."

One entry in Latin.

- In 1689. "Thomas the son of Walter Stephens Rect^r of Tingrass and Judith his wife was born Oct y^e 16th and baptized the seventh of November 1689."
1692. "Daurkas, the daughter of John Reynell bapt. June 21."
1697. "Christopher y^e son of Gideon Maynard, gent. and Elizabeth his wife was bapt."

In 1700 and 1701 Baptismal entries in Latin.

1700. "Henricus filius Gilberti Yard : armigeri."

If time permitted the search, it would be easy to find in these Registers, of an earlier and later date than that which we have reached, names and circumstances, some few perhaps of general interest, and more of special interest to families still remaining, which have been long settled in the locality. But I must content myself with placing before you a list of Christian names which I have extracted from the Registers in the year 1689, and a few years later, some of them of an unusual character, and a large proportion taken out of Holy Scripture :

"Aaron, Miriam, Andrew, Nathanael, Melchisedec, Melchizedek, Daniel, Jacob, Rebecka, David, Johan, Joanna, Simon, Peter, Martha, Lydia, Susanna, Susannah, Benjamin, Israell, Abigail, Hanah, Abraham, Gideon, Amos, Judith, Damaris, Daurkas, Absolom, Christopher, Xtopher, Christian, Grace, Faith, Temperance, Charity, Dulcibella."

But we must not lay to the charge of our forefathers of that period a monopoly of eccentricity in the selection of Christian names. It has been my duty to add to the number of such in the Highweek Registers within the last twenty

* The name of Gavericke, in apparently different social positions, frequently occurs in the Highweek Registers. It was a man of this name into whose possession Mainbow estate, in this parish, came, which had belonged to Torre Abbey before the Dissolution.

years. I will mention one or two. A person died in a caravan in the parish, and was buried at Highweek, about whose name a doubt might be entertained whether it referred to a male or female. The name was "Defiance," and was borne by a woman. On another occasion an entry was made in the Marriage Registers, about which I feared, when I inspected the Book, that a hoax had been attempted on my worthy Coadjutor who performed the Ceremony. The Bride's Father was entered as bearing the Christian name of "Shadrach Meshach Abednego." I thought it my duty to make enquiry, and found that the Christian name was quite correct, and was told in addition that the good man, having been blessed with three sons, called the first Shadrach, the second Meshach, and the third Abednego. One of the most interesting entries which I have observed in the Marriage Registers of the parish in recent times is the Marriage of the late Professor Maurice at Highweek Church on the 4th of July, 1849. John Frederick Denison Maurice, being then a Widower, forty-three years of age, residing in Queen's Square, London, was married to Georgina Frances Hare Naylor, by J. C. Hare, Archdeacon of Lewes, in the presence of Gustavus Edward Cockburn Hare Naylor and Elizabeth J. N. Holdsworth. The bride was at that time residing at Bradley Wood, in the parish of Highweek.

In the following month is recorded in the Register the burial of Mrs. Maurice's mother, Anna Maria Hare Naylor, who died at Bradley Wood at the age of 76.

Sometimes, even in recent years, one comes across extra-official information in the Register Books relating to the person referred to. Thus in the year 1823 my worthy predecessor, Dr. Whipham, records of a certain William Downing that he was "overwhelmed in a sandpit." In the year 1830 the officiating minister notes that a certain Robert Bennett, aged 17, was "drowned whilst bathing during Divine Service." In 1834 and 1836, it is recorded that one woman was "accidentally burnt;" and that another died "suddenly." But usually, as most persons are aware, Burial Registers contain little more, in reference to each person buried, than the name, the residence, the date of burial, and the age, with the name of the officiating minister, reading to persons of reflection the silent lesson of the great variety of ages at which this mortal life is terminated.

Among the contents of a Parish Chest we frequently come across Faculties from the Bishop's Court giving sanction to important alterations in Parish Churches or Chapels-of-ease

I find three such Faculties in the Parish Chest of Highweek—two of them relating to Restorations and Alterations of the Parish Church and St. Mary's Chapel during the period of my own residence in the Parish for some three-and-twenty years, and containing nothing worthy of special remark in a paper of this kind; but some portions of the third Faculty, granted by the Bishop's Court in 1831, may give occasion to suspend our censure, on grounds of taste, on the inhabitants of any particular Parish for what they did to their Church at the period referred to, when we recall to mind, that violations of good taste and propriety in Churches, as we now deem them, were not only common in the country generally, but were sometimes expressly sanctioned by the Consistory Court of a Diocese. The faculty to which I refer, dated 1831, actually ordered "that the Pulpit the Minister's and Clerk's Desk and Font were to be removed to the space nearest to the altar." Perhaps I need scarcely remark that this arrangement was long since altered; and we may be thankful that any attempt to restore such an arrangement now would be met with such a storm of disapprobation as effectually to put a stop to it.

The ancient custom of perambulating the boundaries of Parishes is little known to the present generation; and indeed its necessity has been well-nigh superseded by the legal provision of Maps for each Parish. The perambulation usually took place on one of the three Rogation Days immediately preceding Ascension-Day, and had a twofold object; on the one hand, to supplicate the Divine Blessing on the fruits of the earth; and in connection with that idea, we find, in the Book of Homilies, put out in the 16th century, a homily divided into three parts, specially designed for the improvement of these three days; and, on the other hand, the object was to preserve in all classes of the community a correct knowledge of, and due respect for, the bounds of parochial and individual property.

I find in the Highweek Parish Chest two Papers, both dated in the year 1813, giving the Boundary Line of the Parish, specifying where the Perambulation was to begin, and containing extremely accurate directions, extending even to gutters, as to the exact course of perambulation which the Parishioners were to follow. It would appear that the Parochial Perambulation did not always take place on one of the Rogation Days; for one of these Highweek papers, which is signed by Thomas Whipham, vicar, and Robert Bearne, Parish Clerk, specifies that the Perambulation in 1813 was made in the Autumn.

Had leisure permitted I should like to have searched another set of books in a Parish Chest belonging to Highweek; viz., those relating to Parochial Expenditure, especially those containing an account of Church Rate disbursements. You sometimes come across in such accounts a very unexpected item, even in a rural Parish, connecting itself with the general history of the country at the time, as, *e.g.*, in another Parish of this County, with which I am acquainted, you might see in a Parish Book of the seventeenth century the amount paid for "washing the Church after the soldiers." Whether you would find such an item as that in the Highweek Parish accounts I have not found time to discover; but you would find there, in the Church Rate accounts, some items which may surprise persons not acquainted with the parochial customs of our forefathers; you would find disbursements, not merely, as you would suppose, for maintaining the Fabric of the Church and its Services, but for the destruction of Foxes and Sparrows, and as I happen to have observed in a cursory inspection of a Highweek Book, of wild Cats likewise. Whether any wild Cats survived all this zeal for their destruction in the neighbourhood, I must leave my sportsmen neighbours to determine. Perhaps it may be well to explain how such seemingly inharmonious expenditure found its way into a Church rate. The fact was that a Church rate, unlike some other rates, was entirely under the control of the Parishioners, without the necessity of applying to Magistrates for their signature; and where the Parishioners were agreed there was no thought of illegal items, or of disputing the liability to pay the rate. Consequently Parishioners were in the habit of charging to the Church Rate for the supposed common good, whatever could not legally be charged to any other Rate.

While regretting that lack of sufficient leisure has prevented me from preparing a Paper on this subject more worthy, in my own judgment, to be submitted to the Members of the Devonshire Association, I shall be pleased if others shall hereby be encouraged to make similar and more successful researches in other Parish Chests, where matters of more general interest may be discovered.

NOTES—GENEALOGICAL AND HISTORICAL.

BEING A SECOND "ESSAY TOWARDS A HISTORY OF BIDEFORD."

BY CHARLES WORTHY.

(Read at Newton Abbot, July, 1884.)

WITH the exception of the ordinary notices of this parish by our county historians, and the facts with which the late Dr. Oliver has furnished us in connection with its church, no attempt has hitherto been made to supply us with an exhaustive and connected account of the origin, rise, and progress of this interesting and ancient municipal borough and port-town; nor am I now about to offer anything more than a few Genealogical and Historical notes, most of which have come under my observation from time to time whilst searching for information on other families and places, and which I have put together for the benefit of the members of our Association. *An Essay, however, towards the History of Bideford* was written, and published at Exeter, in 1792, by John Watkins, LL.D., the author of the *Universal Biographical and Historical Dictionary*, and of several other works.

The name of the place has been indifferently written Beddiford, Bydeforde, Bytheforde, Biddiforde, and Bidiford, and is explained by both Westcote and Risdon to be a corruption of "By-the-ford," "so called," says the latter author, "of a ford through the river there, through which there was some time a passage." This etymology is probably partially correct, although it does not appear to me to convey *all* that is contained in the word "Bedanford," which has been interpreted to express the provision of "Beds, or public-houses of entertainment, *by a ford*;" and the Saxon verb "abidan" (abidan), from which the first syllable is derived, signifies literally to continue, tarry, or stay, to abide, or bide. Hence "Beddiforde," which is the earliest spelling

I have noticed, was intended to express the abiding-place or settlement by the ford.

"For three things this place is remarkable," says Risdon; "first, the arrest for any sum whatsoever sans number; secondly, for the notable bridge which joineth the town divided by the river Touridge; thirdly, for the lords thereof, the Grenvilles, a family that have continued from the Conquest unto this present time, *which in all probability is issued out of the Norman house of Clare.*"

As regards the first circumstance mentioned as peculiar by our historian, it is in some measure explained by his contemporary, Westcote, who similarly notes "three things especially" for which Bideford is famous. "First, as to the value of an action entered in the Mayor's Court," which, he says, "was for so large a sum as the like hath not been in any town or city in England (that I ever heard of). The plaint was against one Hawkeridge for £1,000,000, which it may be was rather an improvement to the defendant's credit, than disgrace to his person; for there are few, I think, but will deem him a man of some extraordinary quality, worth, and efficiency, that could get credit for a million, esteemed a king's ransom. It may be (I tell it you in council) it was but *vitium scriptoris*, in adding two cyphers more than enough." (WESTCOTE, *View of Devon*, under "Bideford.")

The remarkable bridge which spans the river Torridge, about three miles above its confluence with the sea at Bideford Bay, is supported by twenty-four pointed arches, and is 677 feet in length. It was utterly ruined as to its appearance in 1864, when it was widened by the addition of a cast-iron battlemented roadway. It is commonly supposed to have been built in the 14th century by Sir Theobald Grenville, and others, who were influenced and assisted by the "Priest of the place," Sir Richard Gornard. The latter, as the story goes, "was admonished one night in a vision" to lay the foundation "where he should find a large stone fixed in the ground." Although at first disposed to treat the dream lightly, yet when the good cleric discovered in the morning that an immense boulder had actually rolled from the top of the hill during his slumbers, and had established itself in the position indicated to him, he became convinced that it was his bounden duty to further the work of the bridge to the best of his ability, and to incite others to help him. His first efforts met with due success, and having obtained the ready concurrence of the Lord of the soil, the inhabitants of Bideford, who had previously been obliged either to wade

through their broad river, or else cross it in boats, when they required to pursue their avocations upon its eastern bank, were soon provided with the present quaint, interesting, and commodious structure.

According to Westcote, the family of Gornard, or Gurney, owned land in the neighbourhood of Bideford about the period of the Norman Conquest. The Episcopal Registers and other authorities, however, fail to connect their name with its ecclesiastical history: Sir Theobald Grenville certainly existed during the fourteenth century, but he was dead in 1381.

There is evidence that there was a bridge over the Torridge many years previously to this date, since a writ of the third Edward, 11th June, 1342, mentions the chapel of St. Thomas the Martyr *as situated at its eastern end*. At this time the rector of Bideford was probably Augustine de Bottercomb, who is mentioned as such in 1337, when he obtained Bishop Grandisson's licence to attend for some time on his patron, Hugh de Audeley. He was succeeded by Nicholas Braybroke, of a noble Northamptonshire family, Canon of St. Paul's, and Prebendary of York, which latter dignity he exchanged, 3rd March, 1376-7, for the Archdeaconry of Cornwall, with Thomas Orange. He was succeeded at Bideford, 26th July, 1381, by his brother, Robert Braybroke, Canon of Lichfield, who was also collated to the Cornish Archdeaconry, and was consecrated Bishop of London, at Lambeth, 5th January, 1381. He had been presented to Bideford rectory by the true patron, "*John*, son and heir of Sir Theobald Grenville, deceased;" but he seems to have resigned this preferment very soon after "his elevation to the episcopate," since his successor, Roger Beaumont, was admitted in September, 1382. It was during his lifetime that Bishop Stafford, on the 5th of December, 1396, granted an indulgence to all true penitents who should assist "*ad constructionem seu reparacionem longi pontis de Bydeford*."

Probably extensive repairs to the old bridge had then become necessary; but forty years later the structure appears to have deteriorated so much that it was found necessary to rebuild it entirely, since Bishop Edmund Lacy promulgated two similar acts of grace to that of his predecessor, on the 24th May, 1437, and on the 28th June, 1444, "*ad novam constructionem, sustentationem, seu reparacionem pontis de Bydeford*." He had, previously to the latter date, 9th July, 1439, offered like inducements in order to raise a fund for the maintenance of a causeway between this town and Northam.

It was a favourite method with our early bishops to lead their people to devote a portion of their wealth to objects of public utility, or Christian charity, by the inducement of "indulgences," and, as a late well-known author truly remarks, these were by no means intended either as pardons for sins already committed, or as licences for future transgression or immoralities. And it was considered that the condition invariably expressed in the grants, "*vere contritis pœnitentibus et confessis*," would sufficiently explain the motive and intention with which they were conceded to those who, in addition to "heartfelt repentance and firm purpose of amendment," were ready for the practice of both corporal and spiritual works of mercy. It is undeniable that these condonations, which appear to have been initiated by Pope Urban II., in the eleventh century, as a recompense for the hardships and dangers undertaken by the Crusaders, became much abused in process of time, more particularly when able preachers began to be employed to advertise the great advantages which were to be derived from their acquisition, and to declare that all the good works of the saints, over and above those which were necessary towards their own justification, together with the infinite merits of our blessed Redeemer, had been deposited in one inexhaustible treasury, and that its keys having been committed to Saint Peter, and his successors the Popes, the latter were able to open it at pleasure, and to transfer a portion of this superabundant merit to any particular person for a sum of money.

These preachers had found employment in consequence of the action which had been taken by Leo X., who, in order to carry on the structure of St. Peter's at Rome, had granted to Albert the Elector, Archbishop of Magdeburgh, the benefit of the "indulgences" of Saxony, and had farmed those of other countries to the highest bidders. Men, however, soon began to understand that, whatever their primary motive might have been, these concessions had originated in superstition, and, as is well known, the manner in which they had been misapplied contributed not a little to the reformation of religion in Germany, where Luther began first to declaim against the preachers, and ultimately against the "indulgences" themselves.

The latest mention of them I have found in connection with Bideford occurs in 1503, when Bishop Arundell, on the 12th January in that year, published a final one, also in order to raise funds for necessary repairs to the bridge.

In Trinity term, 1608, Alexander Arundell and six others

of the parish of Bideford, exhibited a bill in the Court of Chancery against William Davie and others, which set forth "that there was in the said parish, then standing and had long been built, to the great charge as well of the inhabitants, as also of divers other well-disposed persons, far beyond the memory of any then living, a bridge, for the upholding of which there had been divers feoffments and other assurances, and that thereby had been given by divers persons lands and tenements in fee-simple to the antient yearly value of £20 or thereabout"—"to divers trustees and their heirs in trust, to let the said land, and employ the rents and profits thereof to the best benefit towards the maintenance of the said bridge." "That there were then remaining alive but four feoffees" (out of twenty-four), "the defendants, who were weak and aged," and who refused to convey to twenty-four other persons according to ancient usage, but proposed to enfeof fourteen persons only of their own election. "That large sums had been received of the said bridge lands, which had been lent to divers persons without good security; that the defendants had converted some of the money received to their own use, and that part of the rents had been paid by their directions for the entertainment of strangers and in banqueting and feasting amongst themselves. That the said bridge was out of repair and faulty in many particulars, and might then be amended at small charges, but would in the end cause far heavier charges in the repairing than if in time the said faults should be amended."

The defendants in their answer confessed that the lands had been given for the use of the bridge, and for other good uses and purposes. The plaintiffs replied to the said answer, and the cause being at issue, a commission was awarded for the examination of witnesses, directed to Sir Amias Bampfild, knight, Tristram Arscott, Thomas Docton, and Philip Risdon, Esqrs. The three last certified to the Court, that the parties, at the request of William (Cotton), Bishop of Exeter, Sir William Pole, knight, Hugh Wyatt and Hugh Walton, esquires, being commissioners with others appointed by virtue of the 43rd of Elizabeth, had referred the final determination of the matter to them, Sir Amias Bampfild, &c. And that they had upon the 9th January (9th James) with the consent of the parties determined upon certain articles to regulate the future management of the charity.

These articles provided :

That a survey should be made, in writing, of all the bridge lands before the ensuing Christmas.

That a ledger book should be provided in which the said survey should be registered together with a rental of the lands.

That all writings connected with the trust should be delivered by the then feoffees to new feoffees before the next Michaelmas.

That there should be two wardens or receivers and one assistant yearly chosen within the borough by the Mayor, &c., for the receipt of the rents and heriots of the said bridge lands and for the needful reparation of the bridge.

That the same electors should yearly appoint two persons as treasurers of the bridge lands on the feast of St. Matthias.

That forthwith there should be raised, out of the next fines or incomes that should be made of the said lands or of the stock then remaining, the sum of £20, which should be employed as a continual stock for setting the poor inhabitants of the said parish on work by the direction of the Mayor and Commonalty.

That 18 new feoffees should be appointed before the ensuing Michaelmas, and that the number when reduced to six should be made up to 18 in future, to be inhabitants of Bideford. Any feoffee leaving the borough to be called upon to resign his office.

And finally that the feoffees for the time being should from time to time survey the said lands at public Survey Courts, to be kept in the town-hall or in some other public place within the said town, and notice thereof publicly to be given in Bideford Church three successive Sundays after morning prayer.

By a Chancery decree 18th May, 10th James I., it was ordered that the above articles should for ever thereafter be observed, as if every one of them had been judicially pronounced and decreed upon a full and open hearing of the said cause in open court.

These lands appear to have been of considerable extent, and to have comprised property in Bideford, Barnstaple, Combmartin, and Wareland, in the parish of Westleigh; and Robston, in Roborough, Cheping, Great Torrington, Alverdiscott, Northam, Abbotsham, and Exeter are also referred to in an indenture bearing date 27th August, 1730. The feoffees do not seem to have been in receipt of rent for any premises situate in Barnstaple, Combmartin, or Exeter in 1819-20, when the Charity Commissioners visited Bideford; and in respect, at all events, of the first two places, there was then no evidence beyond the trust deed of 1730 to show that any

property in them had ever belonged to the trust. The gross income from the Bridgeland Tenements then on lease amounted to £55 13s. 3d., and from those let at rack-rent to £329 10s. 4d.—total, £385 3s. 7d. This included the receipts from twenty-eight houses in "Bridgeland Street," which had been constructed just previously to the year 1699, and which is described in a Corporation deed, dated 4th of May in that year, as a "new street," which had been built subsequently to the Chancery proceedings upon land "heretofore filled with ruinous dwellings," in consequence of the increasing trade of the town and the scarcity of good houses there for the inhabitants.

In the year 1810 the feoffees were possessed of £2100 stock in the Three per Cents., arising from former savings; and in this year the bridge was repaired and widened, and the parapets were rebuilt. In consequence of this expenditure it became necessary to sell out the whole of the stock and to borrow £900 on bond, which debt was gradually liquidated out of the income, until it was finally cancelled in 1817; and at the period of the visit of the Parliamentary Commissioners the feoffees had again saved £1050, which were invested in Consols.

With reference to the property at Combmartin and Barnstaple mentioned in the Corporation deed of 1730, and of which the Commissioners were unable to recover any trace at the beginning of this century, it appears that a certain Thomas Styke, of Combmartin, at the festival of Easter, in the year 1417, charged his tenement there with a yearly rent of a silver halfpenny during his life, and of sixpence after his death, to be paid at the Purification of the Blessed Virgin "custodibus longi Pontis de Bideford."

In Edward IV.'s time, Thomas Redwyn gave a rent-charge of 12d. from his tenement and courtlage near Page Lane, Barnstaple, for the benefit of the bridge; and John Aps devised a tenement in the High Street of Barum for the repair of Barnstaple Bridge, but with a charge of 4s. at Michaelmas to the Bridge Wardens of Bideford. (*Ecclesiastical Antiquities of Devon*, part iii. p. 44.) Dr. Oliver, however, does not mention where the documents relative to these bequests are to be found.

From an inquisition relative to the estate of Joan Legh, Lady of Estlegh, held at Fremington, April, 1393, it was found that this charitable dame had given half a ferling of land, called Wareland, on the west part of Legheforde, "in subsidium operis Pontis de Bediford imperpetuum." A rent-

roll of the Bridgelands shows that a tenement called Warelend, consisting of 20a. 3r. 14p., and situate in the parish of Westleigh, was leased to Samuel Gordon for fourteen years, from Michaelmas, 1817, at the rack-rent of £35. In January, 1347-8, Walter Cnoll being Provost of Bideford, Henry Burgeys charged his tenement on the south side of Maydene-strete there with a rent of 12d., half of which was to be applied "ad opus pontis predicti," and the other half to furnish lights for the parish church. The feoffees are (or were at the beginning of this century) the owners of no less than eight houses and gardens and one orchard, all situated in Maiden Street, within the borough of Bideford.

The Charity Commissioners state that "it appears from a tablet in the church that Alexander Arundell, who died in October, 1627, *but whose will we have not been able to discover*, gave 13s. 4d. annually for ever out of an estate in West Morchard called Rudge Arundell. . . . The property of the Rev. William Radford. . . . This annuity has usually been paid to the overseers of Bideford and carried to their general account." (*Report of the Charity Commissioners* [Besley, Exeter], vol. ii. p. 313.) The Rev. Alexander Arundell was rector of Lapford, and was instituted 19th December, 1623 (patron William Leigh de Northam) to the rectory there, then void by the death of John Rice, who had been presented 7th September, 1599, by James Welshe, gentleman, by grant *hac vice* of Alexander Arundell, Esq.

Alexander Arundell, who had presented in 1487 Nicholas Trerice to this rectory, is described in Bishop Bothe's *Register*, fol. 129, as "Dominus de Lapford." After him Alexander Arundell de Treryse, armiger, was patron in 1508; and Thomas Arundell in 1525. The will of the Rev. Alexander Arundell, *which the Charity Commissioners were unable to discover*, was proved by Mary Arundell, his relict, in the Principal Registry of the Bishop of Exeter, 9th November, 1627, and his personal estate amounted to £1009 16s. 3d. He was succeeded at Lapford 6th of February, 1627-8, by George Allen; and on the 21st of the *same month and year* there was a licence granted for the marriage of "George Allen, rector of Lapford, and *Mary Arundell, widow, of the same parish.*" Mrs. Allen survived her second husband, and proved his will likewise 29th January, 1627. Personalty, £225.

I will now pass to the third circumstance particularly noticed by our historians as remarkable in the history of Bideford. The manor, originally the property of Brictric, the unfortunate son of Algar, passed at the Conquest to

Queen Matilda, as parcel of the honour of Gloucester. It is well known that William Rufus gave this important lordship to Robert Fitz-Hamon, who had particularly distinguished himself in an expedition against the Welsh, and in whose country he had been established as "Prince of Glamorgan." Prince, in the *Worthies of Devon*, gives the descent of the Grenvilles from Richard, the brother of this Robert; but many of his particulars are contradicted by the editors of the 1810 edition of his work, who, in a long and elaborate note, have confused the genealogy of the early members of the house even more than he appears to have done. Many of their statements appear to be erroneous, and their whole article might have been well made more explanatory. Risdon, as I have noted already, surmises that this family may have issued out of the Norman house of Clare, which they certainly did not.

Rollo, the Danish Jarl, surnamed the Ganger, because (it is said) his bulk was so unwieldy that no horse could be found strong enough to carry him, and he was consequently obliged to go on foot, obtained a concession of a considerable part of Neustria from Charles the Simple, whose daughter Giselle he married; but having no issue by her, he took for his second wife Popeia, daughter of Berenger, Earl of Bayen, by whom he had issue William "Longue Epée," or Long-sword, his son and heir; and a daughter Gerlette, or Giselle, married to the Duke of Aquitaine. This William, who was subsequently baptized, *when his name seems to have been changed to Robert*, succeeded his father as Count of Rouen—for the title of Normandy does not appear until the eleventh century—and governed his principality for twenty years, and was ultimately murdered, *not in the year 960, as stated by Prince's editors*, but on the 10th Calends of January, 942.

By Sprota his wife, daughter of Hubert, Earl of St. Lis, he had issue Richard, surnamed "Sans Peur," who ruled for fifty-two years after his father's death; and who married, firstly, Emma of France, daughter of Hugh Le Grand, and sister of Hugh Capet, by whom he had no children; and, secondly, Gunnora, a sister of a Danish nobleman called Herfast, by whom he had three, some say five, sons, and three daughters. Of the latter I will only notice Emma, who has been called "The Flower of Normandy," and who was twice married, first, to the Saxon King Ethelred; and secondly, to his successor, after a short interval, Canute the Dane, despite his having been a mortal enemy to her former husband.

Of the sons, Richard (succeeded his father in his dominions), is known in history as "Le Bon," or the good, and was the grandfather of William the Conqueror; Robert, the second-born, was created Earl of Eureux, and was subsequently Archbishop of Rouen; *Mauger*, the third son, had the earldom of Corbeil, a town situated on the Seine, fifteen miles south of Paris. *Mauger* was succeeded in his earldom by his son Hamon, who was killed in battle during the lifetime of Duke Robert of Normandy, father of the Conqueror, and who left a son Hamon, distinguished by the affix "Dentatus," because he had been born with teeth. He was Earl of Corbeil,* where he built and endowed a collegiate church, in which he was afterwards buried, and was also Lord of "Thorigny, Granvill, Brey, and Creuly." He married Elizabeth D'Avoye, widow of Hugh le Grand and sister of the Emperor Otho, by whom he had three sons, Robert Fitz-Hamon, to whom I have already referred, Richard, called, as was customary, De Granvill, after one of his father's lordships, and Hamon. These three brothers, Robert, Richard, and Hamon, came over to this country with the Conqueror, and as his relatives had naturally a considerable position amongst his followers, Robert Fitz-Hamon, the eldest, was certainly owner of Bideford, in right of the honour of Gloucester; but this possession can have added but little to his importance, since I find him styled "Robert Fitz-Hamon, by the grace of God, Prince of Glamorgan, Earl of Carboil, of Thorigny, and Granville, Lord of Gloucester, Bristol, Tewkesbury, and Cardiff, Governor of Wales, near kinsman unto the King, and General of all his Highness's Army in France." He met his death at Falaise in the year 1107, where he was mortally wounded in the temples by a spear. His body was brought to England, and was buried in Tewkesbury Abbey, at first in the chapter-house, but it was afterwards removed to the church of that monastery which he had recently rebuilt, and was placed between two pillars on the south side of the choir. By his wife Sibill, a daughter of Roger de Montgomery, Earl of Shrewsbury, he had no male issue; two of his daughters, Avis and Cicely, professed as nuns, and became respectively Abbesses of Shaftesbury and Winton; Amice, the fourth daughter, was the wife of the Earl of Brittany; whilst the eldest, Mable, who was eventually heir to her youngest uncle, Hamon "Dapifer," married Robert surnamed the "Consul," a natural son of the King, Henry I., who thereupon invested him with the Lordship of the whole honour of Gloucester.

* The word is usually incorrectly written "Corboil."

But the Norman estates went to Richard de Grenville, as heir male to his father, Mauger, failing such issue of the eldest son, according to the laws of Normandy. He had participated in the Welsh plunder, had acquired the Lordship of Nethe, and was the founder of the Cistercian Abbey there, the building of which was commenced in 1129. He likewise held the manor of Bideford from the new Lord of the honour of Gloucester, and he was possessed also of Kilkhampton, in the county of Cornwall, where, as Prince says, "I well know that this family have had their chiefest habitation for many generations. . . . But the first residence thereof, Dugdale and others tell us, was at Bytheford aforesaid: however it may not be questioned but that alternately they inhabited at both, sometimes at the one, and sometimes at the other, as they were disposed." (*Worthies of Devon*, p. 440, edit. 1810.)

He married *Constance*, particularly mentioned in the Confirmation Deed of the lands he had given to Nethe, executed by his niece Mable, Countess of Gloucester, and by her son William. It has been stated that she died childless, but that his second wife Isabel, a daughter of Walter Giffard, first Earl of Buckingham, bore him two sons, Richard and William. He must, however, have had more children than these, as Robert de Grenville occurs as one of the witnesses to the foundation Charter of the Abbey of Nethe; and Gerard de Grenville was certainly *brother* to the latter, since Sir Eustace de Greneville, Constable of the Tower of London, 16th of King John, mentions in a deed his uncles *Robert and Gerard*. This Gerard held of *Walter Giffard, Earl of Buckingham*, three Knights' Fees in that county, and is also shown by the Pipe Rolls, 3rd Henry II, to have paid his proportion to an "aid" levied by the Sheriff there in 1156. The aforesaid Sir Eustace de "Greneville" (whose parentage is not quite clear, but who was probably son of Ralph de "Granville," one of the witnesses to a grant in favour of St. Stephens, Caen, by Roger, Earl of Arundell, *brother* of Sibil, wife of Robert Fitz-Hamon), was a benefactor to Nutley Abbey; and to one of his conveyances of a half hide of land to that monastery, are appended the names of Robert de Greinvile, Gerard de Greinvile, and *William his brother*. So that we may fairly conclude that the issue of Richard de Grenville, of Bideford, was Richard, his son and heir, William, Robert, Gerard, and Ralph. In the year 1147, being then of advanced age, he took the vow as a Crusader, and started for the Holy Land. He died on his journey there, 1147, 13th of Stephen.

Robert de Greinvile, who witnessed the charter to Nethe, had issue two sons, Gerard and Robert (both mentioned in a charter of their cousin, Sir Eustace de Greinvile, to William, son of Nigel, of a yard-land in Chilton). Gerard, the eldest, married, and had issue four sons; but after a few generations his line terminated in coheirs, and his great granddaughter Nichola was the wife of Sir Reginald Hampden, from whom the Hampdens of Buckinghamshire are lineally descended. Robert, the youngest, married a certain "Erneberche," with whose consent, and with that of Gerard, his eldest son, he became a benefactor to Nutley. William de Greinvile was his second son; he is frequently mentioned in the Register of Nutley Abbey, and attended King John in his expedition to France in the 15th year of his reign. From Richard, son and heir of Gerard de Greinvile, the family of Grenville of Buckinghamshire are derived.*

I must now return to Richard de Granville, who succeeded his father Richard, and held the manor of Bideford by half a Knight's fee of the honour of Gloucester. He was succeeded by his son, also called Richard, who, by an undated charter witnessed by Sir Richard Coffin, Sir Richard Spekoott, and several others, granted "to all those who hold or shall hold a burgage in the town of Bydeford, to the East and West of Toridge water . . . all the liberties of Bristol," as far as they were in his power to grant them, to them and their heirs for ever; forsooth, that each person holding a messuage and garden, and six acres out of his demesnes, is to pay for the same 12d.; but whosoever holds a messuage and garden only, is to pay 6d. on Michaelmas-day "to me or my Bailiff of Bydeford." He grants also Common of Pasture to the burgesses throughout his whole lordship on the west side of "Torith water;" suit to his court on Tuesday, every month, when each one of the burgesses is compelled to attend, unless he can prove that he is "beyond the seas, or on a pilgrimage, or employed in buying goods out of the county." Liberty to choose amongst themselves a Town Provost every year, who is to receive the toll of the town, paying yearly to the lord ten shillings, and the toll of the market on Monday. The burgesses paid four marks for this grant. To it is appended a circular seal, on which is a heater-shaped shield,

* The direct descendant of this branch was Richard Grenville of Woolton, county Bucks, who married Hester, sister of Viscount Cobham (creation 1718), and whose title she inherited under the limitation. She was created Countess Temple, in her own right, October 18th, 1749; and her son Richard, who succeeded her as Earl Temple in 1752, was great great grandfather of the present Duke of Buckingham and Chandos.

charged with three organ rests, the inscription surrounding it being, "SIGIL. RIC. DE GRENVILE."*

In the second year of King John, as "lord of Bedyford and Kilkhampton," he paid 40 marks and a palfrey to have the assize of the advowson of those two churches against the Abbot of Tewkesbury.

He died in the 6th of King John (1204), leaving issue by his wife Gundrea, Richard, his son and heir, and several daughters, all under age.

Richard Grenville was probably about nineteen years of age at the period of his father's death, since it appears by the Patent Rolls, 8th John, m 2, that in 1206 he paid five marks to equalise the privileges of the inhabitants of Bideford with those of Exeter. He died in the second year of Henry III., 1217. His wife is said to have been Adeline, widow of Hugh Montfort; but it is more probable that she was the daughter and heir of Thomas, son of Nicholas de Middleton, whose marriage with all her inheritance, fees, &c., had been confirmed to him by the king in the year 1204. (Cart. 6th John.)

His son, also called Richard, became a ward of the Crown, and the custody of his lands and person was granted by Henry III. to Ralph Bluet. Dr. Oliver prefaces his notes on the Parish of Bideford (*Ecc. Ant.* 3, 38) with the remark "that the patronage" (of the church which had been given by Robert Fitz Hamon to Tewkesbury Abbey) "was vested in his eldest daughter, Mabilla, who married Robert, the natural son of King Henry I., created by his father Earl of Gloucester; and that the Abbey of Tewkesbury shortly after lost its right to the living, *perhaps by exchange for Chittlehampton*; and that Bishop Bronescombe, in November, 1259, performed the dedication of the parish church of St. Mary de Bideford. To the Manor of Bideford, as we read in folio 7 of Nevill's Register, the advowson of its church is annexed and dependent." As I have shown already, there was some controversy as to the right of presentation to the rectory of Bideford in the year 1200, when Richard Grenville obtained an "assise of darreign presentment" against the Abbot of Tewkesbury.

In the year 1237 a suit, which had lasted five years, in respect of the right of presentation to both Kilkhampton and Bideford, came before William York, and others, justices in Eyre, at Launceston, and a compromise was then effected,

* This deed is a confirmation of a previous one which had been granted by his father. (See Collins, *sub Carteret*, v. 65, who quotes from the *Evidences of Sir Bernard Granville* "penes Geo. Harbin Cler.")

when the abbot surrendered all claim to the advowson of both these benefices in favour of Sir Richard Grenville, who had then been knighted, in consideration of five marks to be paid by the said Sir Richard to the said abbot annually as long as he lived, and after his death the community of Tewkesbury were to have his lands at Campeden, in Gloucestershire, in exchange. He married Jane, daughter of William de Trevint, by whom he had a son, also called Richard. He died in 1245, and was buried in the chapter-house of S. James's Priory, Bristol; and the same year his widow brought forward her "writ of dower" to obtain the restitution of the land of Campeden, which her husband had granted in compromise to the Abbot of Tewkesbury.

In the year 1255 her son Richard, not being a knight, and holding "viginti libratas terræ in Com. Devon." by knight's service, was summoned to take that degree. In the year 1261 he presented Henry le Bratton to the rectory of Bideford,* and in 1272 he obtained a charter for a market for this town on Monday, and a fair on the vigil of St. Margaret the Virgin. It was found at this time that he held "antiquas furcas," and an assize of bread and beer at Bideford, and free warren on the east side of Toryzwater.

In 1296 (25th Edward I.) he was summoned to be in London by Sunday after the Octave of S. John the Baptist, "to go with the king beyond the seas for their honour, and the preservation and profit of the kingdom." Four years later he took part in the Scottish expedition. He married Isabel, daughter of Joscelyn de Monte Tregunion, and had issue Bartholomew, his eldest son, and others. The period of his death is uncertain. The said Bartholomew, in a deed dated at Bideford, Monday after St. Augustine's-day (7th Edward II.), is described as "Lord of Bideford." This document (amongst the family evidences) has a similar seal to that already described, with the legend, "SIGILL BARTH. DE GRENVILE MILITIS." His father had probably died before 1311, since Stapledon's *Register*, fol. 67, contains the licence granted to Bartholomew and to Amy his wife on the 11th January in that year, "pro capella sua de Bydyford." He was one of the knights of Devonshire returned into Chancery as "*bearing ancient arms from his ancestors*," in 1323, and he was also then certified to be "of great and almost of decrepit age." His wife,

* It is to be remarked that the right of the Grenvilles to present to Bideford was hardly yet admitted; for in 1268, 26th December, Roger de Leycester was presented to the rectory then void; patron, Gilbert de Clare, Earl of Gloucester.

Amy, was a daughter of Sir Vyell Vyvyan, and she describes herself as a widow, in a deed dated at Bideford, Tuesday after St. Ambrose (19th Edward II.), 1325. The seal shows the Grenville arms impaled with those of her family (six mullets). Henry, son and heir of Sir Bartholomew, died in 1327. Immediately after the death of his father he had released to his mother the £60 12s. 3d., payable to him out of the manor of Kilkhampton, for her life, reserving to himself £20 annually. This is shown by his *Inquisition Post Mortem*, which also proves that Dame Amy Grenville held the manors of Kilkhampton and Bideford for life of the Earl of Gloucester, as of the honour of Winkleigh,* forfeited to the king by Hugh le Despencer the younger, and "that Theobald, son of the aforesaid Henry, is his next heir, and was on Whit-Sunday last past four years old. (30th September, 1327.)

Sir Theobald is the reputed founder of Bideford Bridge, and is also one of Prince's "Worthies." He is styled "Lord of Bideford" in two grants of lands there. (35th Edward III.) In 1377 he conveys to Robert Langdon, Agnes his wife, and John their son, two burgages in Bideford and suit to his Manor Court. This deed has a seal, with the three rests for arms, and another upon a knight's helmet for crest, circumscribed, "SIGILLUM THEOB. DE GRENEVIL MIL.," dated Bideford, Tuesday after Michaelmas-day (1st Richard II.).

The last of his deeds amongst the family evidences is also dated at "Bydyford, on Wednesday, the Feast of the Conversion of St. Paul, 1379."† He married Joyce, daughter of Sir Thomas Beaumont, and is said to have had issue a son also called Theobald, who married Margaret Courtenay, daughter of Hugh, Earl of Devon, who bore him two sons—John and William. He also received the honour of knighthood, but must have died *in vita patris*, or else very soon after, since John Grenville presented to Bideford on the 26th July, 1381, and is then described as "*son and heir of Sir Theobald Grenville, deceased.*"

This John was returned one of the knights for Devon in 3rd Henry IV., and in 1403 "William Greynvyll, son of Theobald Greynvyll, Knight," by his deed recites, "That whereas his brother, Sir John Greynvyll, Knight, and Margaret his wife,

* Winkleigh, it will be remembered, was the chief seat of the honour of Gloucester in this county.

† John, son and heir of Walter de Stowe, grants to Sir Theobald and his heirs two messuages in Stowe, within the manor of Kilkhampton. Seal, Grenville, quartering a crescent.

held the manor and borough of Bydeford in Com. Devon, with the advowson of the same church, &c., and other lands and tenements in the parish of Bydeford, called Fordelond, Eggefen, and Thorne; &c., and lands in Kilkhampton. He, the said William, *ratifies* and *confirms* them to the said Sir John. Seal, three rests; crest, a pelican vulning herself." "SYGILLUM WILLIMI GRAYNVILL."

Sir John Grenville married Margaret, daughter and coheir of Sir John Burghers, Knight, but had no issue. He died in the year 1411, and was succeeded by his aforesaid brother, William. His widow was re-married to John Arundell the younger.*

William Grenville never acquired the dignity of knighthood. In 26th of Henry VI., 7th of November, as Wm. Graynefeld, Esq., he granted lands to James Chuddeleigh, Wm. Chuddeleigh, and Hugh Stucle, Esqrs.

He was twice married, to Thomasine, daughter of John Cole, who is mentioned in an indenture made at Bideford, Monday after the Feast of St. John Port Latin, 5th Henry VI.; and in a deed dated at Stowe, 20th July, 24th Henry VI., his wife Philippa (sister to Wm. Lord Bonville) is referred to. He died before 1450. His widow married again, and her second husband, John Almescombe, and herself are mentioned in a deed of 29th Henry VI., in a grant of land from John Copleston (Coll. Joh. Anstis, Garter), and in March, 1457-8. This "John Almescombe and Phillippa his wife, lady of the Manor of Bideford," presented Lewis Pollard to the rectory there, void by the death of John Walhopp. (The date of this institution, "1427," given in the *Ecclesiastical Antiquities*, vol. iii. p. 41, is manifestly a misprint, since Dr. Oliver refers to his authority, fol. 7, Nevill's Register.)

In 27th Henry VI., 1448, Thomas Greynvyll, described as "*son and heir of William Greynvyll, Esq.,*" with Anne his wife, grants a tenement in Bydeford to Richard Asherigge, "He doing suit at *our* courts." So that his father was probably then alive. In the 31st Henry VI. the same Thomas is mentioned with *Elizabeth* his wife, in a conveyance of land at Bideford, late held by grant of Sir William Hankford by John Bishop (dated Sunday before the Conversion of St. Paul, in the year above mentioned). In 1480 he was sheriff of Gloucestershire, and two years later he filled the same office in Cornwall, having been then knighted. He died in or about

* John Arundell presented to Bideford, by grant, *hac vice*, 11th January, 1420.

the year 1483, leaving by his wife Elizabeth, sister to Sir Theobald Gorges, Thomas his son and heir, and a daughter, Elizabeth, married to William Yeo, of Heanton Sachville.

The true history of the months of May and June, 1483, has never been clearly ascertained; it is probable, however, that the new "Squire of Bideford" was not an ardent supporter of the designs of the Duke of Gloucester, since he "sued out his pardon" in the first year of Richard III., and according to the Statute of Additions, he is duly described as "Thomas Greynfield, late of Kilkhampton, in Cornwall, Esq.; *alias* late of Bydeford, in Com. Devon, Esq.; *alias* Thomas Greynvild, de Kilkhampton and Bydeford." In 1488 king Henry VII. sent an army to the relief of Brittany, and by a commission dated at Maidstone, 23rd December, his majesty directs Sir Robert Willoughby de Broke, knight, Sir Richard Edgecomb, knight, and Thomas Greynvile, Esq., "to summon and examine what number of archers, armed, and arrayed, at the king's expense, the county of Cornwall could provide; and to article with them, and to review them, and to certify the number of archers that all earls, barons, knights, and others, are to find, before the 'quindenes of Hilary next.' On the 11th Jan., 1492, he covenanted with Richard Whitlegh for a marriage between Roger Graynfeld, his son and heir, and Margaret, daughter of the said Richard. This marriage was solemnized shortly afterwards, since, on the 20th of February following, he granted to the said Roger and Margaret his wife certain messuages within the manor of Kilkhampton.

On 4th August, 1494, he presented John Nicholl, and on 31st August, 1499 (on Nicholl's death), Robert Cornwall, to the rectory of Bideford. He was "esquire of the body," 15th Henry VII., and two years afterwards he was created a Knight of the Bath, at the marriage of Arthur Prince of Wales. He married, first, Isabella, daughter of Sir Otes Gilbert, of Compton, by whom he had Roger, before mentioned, and Richard, sheriff of Cornwall, 1st and 10th Henry VIII. (ob. s.p.), and six daughters. By his second wife, Jane Jous (the widow of Hill, of Taunton), he had a son John, and a daughter Jane, first married to Raleigh, and afterwards to Batin. His will, dated "ixth March the yere of oure Lord God mvc'xiii," was proved P.C.C. 12th of May that same year. It is as follows:

"I Sir Thomas Graynfeld Knyght, in my hoole mynde, make my Testament in Maner and Forme following. First I bequeth my soule to Almighty God, and to our blessed Lady, and to all the hooly Saints in Hevyn. My body to be buried in the Church

erthe of Bedyford, in the south est Parte of the Chauncell Dore. Where my Mynde is, yf I lyve to make an Altarie, and a Preste to sing there to pray for me, and myn Auncestors and Heires for ever. The said Prest and Pore-men to be put in by the Discrecion of myn Heires and Executors. Farther I will that my said Chappell, whensoever it be made, and the Church of Bedyford the meane Season, have my Cope of Tissue, and my vestiment of the same, and a suet of blacke velvet to be made of such velvet gownys as I have, by the Discrecion of myn Heires and Executors. Also I will, that *John Greynfelde* yf he be disposid to be a Prest to have the next Avoydance of one of the Benefices of Bedyforde* or of Kykehampton; and yf he will be no Preste, that then my Sonne, Roger Graynfelde and his Heires see him have sum resonable Levying of Londis by their Discrecions. Item I will that my Sonne Roger shall marry my daughter Onor, and to gyve her in marriage ccc markes in money to be leveyed of my landes and goodis.† Item I will that my daughter Jane,‡ which I had by my last Wyff to have cc marke in lyke manner to be leveyed of my goodis and landes. Provided allway, that yf the saide Onor and Jane fortune to dye or ever they be maryed, that thenne they to have nothing of the saide money. But thenne the saide money whenne it is so leveyed to be disposed for my Soulle by the discrecion of my Sonne Roger. Item I give to the Church of Bedyford and to the Brige of Bydisforde vi l. xiii s. 4^d. Item to the Church of Kilkhamton iiii l. Roger Sonne I woll desyr yow, as my Trust is in yow to see this my Will performed and fulfilled, and yow I make myn Executor."

Roger Grenville resided principally at Stowe, on his manor of Kilkhampton, and was noted for his liberality and hospitality. To a deed of 9th Henry VIII., in which he conveys to Richard Gilbert, clerk, his "whole manor and borough of Kilkhampton" to the use of his last will, a round seal is attached, which is somewhat peculiar, since the shield upon it is charged with but *one* "rest" instead of the *three* which had been hitherto borne by his ancestors, and which were continued by his successors. It is particularly noticed by Lord

* Dr. Oliver (*Ecc. Ant.* iii. 41) mentions "*John Greynfyld, whose institution is not recorded,*" as rector of Bideford, but states that, *upon his death*, he was succeeded in 1509, 19th April, by Richard Symon.

† She married, first, Sir John Basset, knight; and secondly, Arthur Plantagenet, Viscount Lisle.

‡ She must have been the *second* wife, and the widow after a very few months, of Wymond (according to Sir William Pole) Raleigh, grandfather of the great Sir Walter. It will be noticed that she was *unmarried* on March 9th, 1514; and Wymond Raleigh was certainly dead July 14th, 1515. Her arms, impaled with Raleigh, are on a bench-end in East Budleigh Church. (See "*Notes on the Raleigh Family,*" T. N. BRUSHFIELD, M.D., *Trans. Devon. Assoc.* vol. xv. pp. 164-166, 177.)

Lansdowne (George Grenville the poet) that the latter arms had remained over the gate of the Norman stronghold, from which the Grenvilles had derived both name and title, from a very remote period.

"Those arms which for nine Centuries had brav'd
The wrath of time, on antick stone engrav'd,
Now torn by mortars, stand yet undefac'd
On nobler trophies, by thy valour rais'd."*

Over the arms, upon the seal I refer to, is the usual helmet, which is surmounted by a griffin's head couped between two wings. By his wife, Margaret Whitleigh, already mentioned, Roger Grenville had Richard, his eldest son; Digory, ancestor of the Grenvilles of Penhale; and John, who died s.p. The marriage settlement of his daughter Christian with James, son of Peter St. Aubyn, is dated 1521. In the pedigree this lady is stated to have been the wife of James Erisey; if so, he must have been her second husband. Another daughter, Phillippa, married Thomas Tremayne; and another, Amy, was wife to John Drake of Ash, in this county. Sir Richard Grenville, son and heir (who was knighted before the 20th December, 1528, when he executed a deed which is sealed with the *single rest* used by his father, but quartered with another coat—a bend charged with three roundles),† was Sheriff of Devon 24th Henry VIII. He was subsequently Marshal of Calais, served under the Earl of Hertford, and was at the siege of Boulogne. He married Maud, daughter and coheir of John Bevil of Gwarnock, by whom he had two sons and three daughters. Both his sons died in his lifetime—the eldest, Sir John Grenville, s.p.; and Sir Roger, who was esquire of the body to Henry VIII., was unhappily drowned in the *Mary Rose*, but left issue by Thomasine, his wife, daughter of Thomas Cole of Shute, Sir Richard Grenville, Sir Charles, and John. The two latter had no offspring. His will, dated 8th March, 1545–6, shows that he was an early convert to the doctrines of the Reformers. He settles Buckland Greynefeld, in Gloucestershire, upon his wife, Dame Maud, for a term of seventy years, "if she so long live;" and entails his "Mansion place in the Town of Bedyford and all the residue of the town and borough of Bedyford, in the County of Devon," and the Cornish property, upon his grandson Richard and his heirs male, with remainder to his own

* "To my dear Kinsman | Charles Lord Lansdowne | Upon the Bombardment of the town of Granville in Normandy by the English Fleet." (*Lord Lansdowne's Works*.)

† Whitleigh—"Arg. on a bend b. 3 bezants:"

brothers—Digory, of Penhale, and John. He died on the 18th March; and his wife followed him on the 26th April, 1550. At this time his grandson Richard, who succeeded him, was only five years of age. As a young man he seems to have seen much military service abroad with the Emperor Ferdinand, and with Don John of Austria at the battle of Lepanto.

He was at home in 1568, when he executed a conveyance of land at East Buckland. In 1569 he was made Sheriff of Cork. Three years later I find him Sheriff of Cornwall, having been elected one of the representatives of that county in the preceding year; and about this time Queen Elizabeth knighted him at Windsor.

He was subsequently Vice-Admiral of England, and in the year 1585 he added Virginia to her Majesty's dominions. He was at last killed near the Azores in that remarkable sea fight on the 31st of August, 1591, the details of which have been so well preserved to us by his contemporary, Sir Walter Raleigh. Although his ship, the *Revenge*, in which for *fifteen hours* he sustained the onslaught of the whole naval power of Spain, was ultimately surrendered to the enemy, yet *she was true to her name*, since shortly afterwards she went to the bottom, during a storm, with 200 Spaniards on board. He had married Mary, daughter and coheir of Sir John St. Leger of Annery, who bore him three sons—Bernard, John, and Roger (the last two died without issue)—and five daughters, of whom Mary, the eldest, was the wife of Arthur Tremayne of Collacombe. His widow survived him some years. By her will, dated 11th November, 1618, she left 40s. to the poor of the several parishes of Bideford, Winkleigh, Broadwoodkelly, and Monk Okehampton. She was buried in Bideford Church 5th November, 1623.

Bernard Grenville, the eldest son, was High Sheriff of Cornwall 38th of Elizabeth, and the next year was returned to Parliament for the borough of Bodmin. He appears to have sold a presentation to Bideford, since, by grant of "Sir Barnard Grenville K^t" Thomas Cholwill and Charles Yeo exercised the patronage in favour of Philip Isacks 30th December, 1625. By his wife Elizabeth, daughter and coheir of Philip Bevil, he had four sons, and a daughter, Gertrude, who married Christopher Harris. Of the sons—Sir Bevil Grenville was 24 years of age, Sir Richard 20, John, of Lincoln's Inn, 18, and Roger 16, in the year 1620. The last died unmarried, being drowned in the service of King Charles I.

Sir Richard Grenville, the second son, albeit a very distinguished man, has had his character much aspersed by Lord Clarendon and others. He appears to have been frequently actuated by the dictates of a violent and revengeful temper, and the admissions, which he himself makes, in his own defence, of conduct which had caused him to incur the heavy displeasure of his exiled king, go far to prove that the descriptions which have been handed down to us of his intriguing and unscrupulous disposition are anything but unjust. The whole history of his life is a wonderful contrast to that of his elder brother, the chivalrous Sir Bevil, and indeed he seems to have had little in common with his long line of illustrious predecessors, excepting their just pride of ancestry, and their aptitude for fighting. "My former life spent has been a soldier," he says,* "as were all my ancestors since the Conquest of England, 1066, ever constantly for services of the Crown of England." The manner in which he first joined the Royal army affords one example amongst many, of the duplicity of his nature, and his deceit upon this occasion was, as is well known, punished, by the murder of his only son, who was hanged in retaliation for his father's desertion by the Parliamentary soldiers.

However, I have neither space nor intention to comment at any great length upon his well-known career throughout the unhappy Rebellion. Both sides of the question as to his conduct at that period may be ascertained by reference to the pages of Clarendon, and to his kinsman's "vindication" of him. (*Lord Lansdowne's Works*, 4to. vol. i. p. 503.)

I will only add that the people in the neighbourhood of Bideford experienced the evil effects of his abuse of the power which had been entrusted to him, and that bitter complaints of his tyranny went up from Barum. Although Lord Clarendon has been accused of having been "over hard upon him," yet it must be remembered that, as Sir Edward Hyde, he had personally suffered from the mischievous effects of his malignity. It was not in human nature to forget it, and although this great historian may be occasionally somewhat bitter, yet, all things considered, he does not appear to display unnatural animosity against one who certainly showed a great deal of undaunted courage in the struggle betwixt King and Commons, but who constantly compromised his party, and exceeded or neglected his orders, to such an extent,

* *Sir Richard Grenville's Defence Against all Aspersions of Malignant Persons.* Printed in Holland, Jan. 28th, 1654.

indeed, that it became necessary at one time to consign him to durance at Launceston; and who ultimately, despite his position and influence, and I must add unwavering loyalty, was altogether excluded from the presence of his sovereign.

It is noteworthy that when he was employed in Ireland, at the commencement of the reign of Charles I., he was accompanied by his kinsman, Monk who therefore received his first military training at his hands. He was knighted at Portsmouth, 20th June, 1627, through the favour of his patron, the Duke of Buckingham, and he was advanced to a baronetcy 9th April, 1630. His marriage with Mary, daughter of Fitz of Fitz-Ford, relict of Percy, Darcy, and Howard, was notoriously an unhappy union, and the whole story of his matrimonial infelicity has been well told by Mrs. Bray in her *Traditions of Devon*, who gives us also a romantic account of the mother's estrangement from her daughter Elizabeth, who is said to have been the wife of William Lenhard. Sir Richard at length died, in self-imposed retirement, at Ghent, in Flanders, and was buried there. It has been said that, after his banishment from the foreign Court of Charles II., by an Order in Council of the 13th January, 1654, he retired from all conversation with mankind, and never even suffered his beard to be shaved until he died. His grave bore this simple inscription :

“Sir Richard Grenville
The King's General in the West.”

It will be a more pleasant task to refer to the services of his distinguished brother.

Sir Bevil Grenville was sent to Exeter College, and graduated B.A. 7th February, 1613. After he left the University his courtesy, civility, and generosity soon distinguished him in his own counties. He had a seat in Parliament either for Cornwall or Launceston in the reigns both of James I. and Charles I., and in 1638 he raised at his own cost a troop of horse for the king, and attended him in his first northern expedition against his rebellious subjects in Scotland. As one of the Cornish knights of the shire, he hurriedly left Westminster at the outbreak of the Civil War, proceeded to Cornwall, and took possession of Launceston, the gates of which he closed in the name of the king; and from this period his gallant achievements have been handed down to us by far abler pens than mine. His career was short but glorious, and we are told that the force he trained

to war he disciplined to piety and strict morals by his own bright example. Alike beloved by his king, by his comrades, and by those he constantly led forth to battle, he fell as a soldier should fall, upon a well-stricken field, upon that memorable day when, with the fearless and undaunted spirit for which West-countrymen have been ever famous, he charged gallantly up the hill at Lansdowne with his tenantry behind him; and it is said that his untimely death was as bitterly lamented by the Parliamentary troops as it was by his own followers. On his person was found a recent letter he had received from the king, which he evidently prized highly, since he had endorsed it with his own hand—"Keep this safe." The University of Oxford honoured his memory with a volume, entitled *Verses on the Death of the Right Valiant Sir Beylve Grenvyle, Knight, who was slain by the Rebels on Landsdown Hill, near Bath, July 5th, 1643*. By his wife Grace (only daughter, by his second wife Grace, daughter and coheir of William Viell of Mudford, near Launceston, of Sir George Smith of Madford House, near Exeter), whose half-sister Elizabeth married Sir Thomas Monk of Potheridge, father of the great Duke of Albemarle, Sir Bevil had four sons and three daughters—Elizabeth (Prideaux), Bridget (Higgon), and Jane (Thornhill). The last died in January 1738–9, and was buried at Wye, in Kent. Of the sons, Richard, the eldest, was born in 1619, and died young; (Sir) John was created Earl of Bath; Bernard* was the father of George, Lord Lansdowne, Baron of Bideford (patent dated December 31st, 1711), who died without issue male; Dennis took holy orders, and became Dean of Durham; he was installed 14th December, 1684, and was deprived 1st February, 1690–1, when he retired to the town of Granville, in Normandy, where he died unmarried, and was buried there.

Mrs. Bray mentions in one of her delightful volumes the discovery of a large mass of correspondence in the old house at Stowe some years since, which the then tenant upon examination found to be a variety of original letters—some addressed to Sir Bevil, and others copies, in his own handwriting, of many that he had himself written. The late Mr. Tremayne, of Sydenham, who saw them, told Mrs. Bray that all these documents "were highly honourable to Sir Bevil, and that they threw some additional light on the conduct of the Royal cause in the West." They were ultimately taken

* Bernard Grenville was the bearer of the letter to King Charles II., containing the final arrangements for His Majesty's return to England.

possession of by Lord Carteret, and the late Mr. Isaac Disraeli endeavoured, but unsuccessfully, to obtain permission to inspect them during the time that he was completing his *Commentaries* on the reign of Charles I. Mrs. Bray adds that she was told, in the year 1831-2, that they had been destroyed. (*Traditions of Devon*, 1838, vol. iii. p. 87.) King Charles had intended to raise Sir Bevil to the peerage, as we learn from a patent dated in the 27th of Charles II., which grants to all his posterity the precedence and privilege of an earl's children.

Sir John Grenville, second son of Sir Bevil, became head of the family by the death of his brother Richard, without issue. He was very instrumental in effecting the restoration of the king, in conjunction with his cousin, General Monk. He was by letters patent, dated Westminster, 20th April, 1661, raised to the Peerage by the titles of Lord Granville, Viscount Lansdown, and Earl of Bath; six days later, by his Majesty's warrant of Privy Seal, he was permitted to use and enjoy the titles of Earl of Carboil, and Lord of Thorigny and Granville. The following words are employed in the preamble to this permit:

"Whereas it appears to us that our right trusty cousin and councillor, John Earl of Bath, etc., is derived in a direct line as heir male to Robert Fitz-Hamon, Lord of Gloucester and Glamorgan, in the reigns of King William the Conqueror, King William Rufus, and King Henry I., and who was the son and heir of Hamon Dentatus, Earl of Carboil, Lord of Thorigny and Granville, in Normandy (which titles they held before Normandy was lost to the Crown of England), whereby he justly claims his descent from the younger son of the Duke of Normandy, as we ourself do from the eldest, &c."

In the same year the king, by a similar warrant, undertook himself, and recommended his successors, to settle the descent of the dukedom of Albemarle, failing male issue of General Monk, upon Lord Bath and his issue; and by another writ, his majesty promised him the reversion of the earldom of Glamorgan, failing heirs to the Marquess of Worcester, and should he leave no son, the latter earldom to revert to the right male heirs of his father, Sir Bevil.

Lord Bath died at his house in St. James, 22nd August, 1701, and was buried at Kilkhampton. He left to certain trustees "all that his borough, manor, and barton of Bideford, in Devonshire, and all lands thereto belonging, for the term

of 99 years, in trust, to raise a sum to satisfy his debts and legacies." There is also by his will remainder of the Devon and Cornwall property, failing his own male issue, to his brothers before mentioned, or their male descendants, to the Duke of Albemarle, and his male descendants; and failing any such, to his own right heirs for ever. By his wife Jane, daughter of Sir Peter Wych, knight (ambassador at Constantinople), who had died 17th February, 1691-2, Lord Bath had five sons and eleven daughters; of these two sons and seven daughters died young; another, Lady Henrietta Maria, also pre-deceased him, and his youngest son, Bevil, died of small-pox, September 15th, 1706.

His son John, by patent of 2nd Queen Anne, March 9th, 1703, was created Baron Granville, of Potheridge, in Devonshire. He was also Lord Palatine of the county of Carolina. He married Rebecca, daughter of Sir Josias Child, of Wanstead, and widow of Charles, Marquess of Worcester, but died without issue, 3rd December, 1707. His title became extinct.

His elder brother, Charles, had succeeded as second Earl of Bath upon the death of their father. This nobleman had distinguished himself greatly as a soldier in the wars of Hungary, and was afterwards, in 1683, with the Duke of Lorraine at the battle of Baracon, and at the capture of Gran. In 1690 the French made several attempts to land in the West. Lord Lansdowne with the county militia guarded the coast so effectually that but little damage was done; his lordship marched with the stannary troop from Plymouth to Torbay on the 25th of July, where he found Sir Bouchier Wrey with his cavalry regiment, and upon hearing the next morning that the enemy had sailed towards Teignmouth, he at once proceeded there with all the horse, but was not in time either to prevent them from setting the place in flames, or to intercept their departure. The fleet after this demonstration appear to have left the coast without any other disturbance save "firing some cannon on a little town called Torkey."

Lord Lansdowne's death was very melancholy. He was preparing to attend his father's funeral, and with due regard to the dangers to which travellers were exposed in those days, he was examining his pistols in a bedroom of the town house of the family in St. James's Street, when it is supposed that one of them accidentally exploded, since his lordship was found shot through the head, and the remains both of his father and of himself were taken down to Kilkhampton

together for burial. By his first wife, Lady Martha Osborne Lord Lansdowne had a daughter who died in her infancy, and was buried in Westminster Abbey. He married secondly Isabella, daughter of Henry de Nassau, Seigneur de Auverquerque, Velt Marshal of the forces of the States-General, and sister to Lord Grantham, and by her had issue an only son, William Henry, third Earl of Bath, born 30th January, 1691-2.

This young peer soon exhibited a taste for warlike adventure, and made two campaigns as a volunteer in Flanders at a very early age. He died in his 20th year of the small-pox, and his titles expired with him.

His two surviving aunts became his coheirs. Of these Lady Catherine had been married to Craven Peyton, Master of the Mint, and had died childless, so that the property passed to Lady Grace, widow of Lord Carteret, and to Lady Jane (wife of Sir William Levison Gower), and an ancestress both of his Grace the Duke of Sutherland, and of the present Lord Granville.

Lady Grace, who was the youngest of the two sisters, had been married when *eight* years old to George, grandson and heir of Sir George Carteret, who had contrived to unite him at the tender age of *five* to the daughter of his old friend, Lord Bath, in order to see him settled in his lifetime, since his father had been killed in action in the sea-fight with the Dutch, 28th May, 1672.

Young Sir George was elevated to the peerage, 19th October, 1681, by the title of Lord Carteret of Hawnes. He died 22nd September, 1695, *æt.* 25, and left issue George, baptized at Hawnes, 11th February, 1688, buried 8th June, 1689; John, who succeeded to the title, born April 22nd, 1691. Philip, *ob.* 1710, *æt.* 18; and one daughter, Jemima, who died anno 1733.

Lady Carteret, although but a young widow, never married again. She was created, by patent bearing date January 1st, 1st George I., Viscountess Carteret and Countess of Granville, with limitation to her son Lord Carteret. She died 18th October, 1744, and was buried in Westminster Abbey.

John, Earl of Granville, and Viscount Carteret, married 17th October, 1710, Frances, only daughter of Sir Robert Worsley, baronet, by his wife Frances, only daughter of Thomas, Viscount Weymouth—the marriage took place at Longleat—and had three sons and five daughters. His *second* wife, Lady Sophia, daughter of Thomas, Earl of Pomfret, died

in giving birth to another daughter. Lady Louisa Carteret, the third daughter by the first marriage, became the wife, in 1733, of Thomas, second Viscount Weymouth. She had two sons. Thomas, the eldest, succeeded his father in the family honours, and was advanced to the Marquessate of Bath, 18th August, 1789; whilst Henry, the youngest, ultimately inherited the estates of his maternal grandfather, and was created Baron Carteret; he died without issue, and was succeeded by his two nephews, Lord George and Lord John Thynne, as second and third Barons Carteret; but they both died childless, the last in 1849. The estates of the Granville family in Bideford were sold off in parcels about 1750, when John Cleveland, father of John Cleveland, who was Recorder of the borough, became the owner of the manor. Grace, Countess of Granville, and John, Lord Gower (eldest son of Lady Jane Granville already mentioned), presented John Harbert to the rectory, 18th May, 1723. In 1703, 13th October, the advowson had become the property of Mr. George Buck, of Daddon, eldest son of John Buck, of Bideford, three times mayor, and an ancestor of Sir George Stucley.

Lysons tells us (*Mag. Brit.* ii. 52): "The late rector, Mr. John Whitfield, who was incumbent from 1742 to 1783, published *Thoughts on Gesner's Death of Abel*, and *The Messiah*, and *Conjectures on some of Horace's Works*."

Dr. Oliver remarks (*Ecclesiastical Antiquities*, vol. iii. 42): "John Whitfield appeared at the visitation of 4th July, 1744. He signed the terrier 25th April, 1745, and states that the east-end of the rectory house was built by John, Lord Gower, 'the most unblemished name of the present age.'"

A short time since I became the possessor of a copy of a petition and complaint, which the parishioners of Bideford felt constrained to present to the then Bishop of Exeter, Dr. Keppel, and with which this rector was very intimately and unpleasantly connected. The contents of the document will probably cause a smile now, but it may be well imagined what distraction and animosity must have prevailed in Bideford between the priest and his flock in the year 1765. I give the document in its entirety, together with the signatures attached to it. Many of those names will still be familiar to some of my readers, although their owners, or at all events, most of them, must have gone to their rest nearly a century ago.

"To the Right Reverend Father in God, Frederick, Lord Bishop of Exeter. The Petition of the Mayor, Aldermen, Deputy Recorder, Capital Burgesses, and principal inhabitants of the town of Bideford humbly sheweth—

"That your petitioners had conceived the greatest hopes from the visit with which your Lordship lately honoured this town, that they should not be under the disagreeable necessity of giving your Lordship any trouble with respect to their Rector, Mr. Whitfield, but finding that their forbearance to complain, instead of having the good effect that might be expected from it, hath rather urged him to show still greater resentment to his congregation, which is now become so great an evil, that your petitioners despairing of any alteration without your Lordship's assistance, have determined to acquaint your Lordship that on Sunday last, at the end of evening service, Mr. Whitfield with a loud voice offered up a prayer to Almighty God in these words, 'God Almighty deliver me from the scum of mankind, this scoundrel people, Amen.' He then rose from his knees, and going through the eyle, spatt at George Buck, Esq., the present Mayor, in his seat, in the most indecent and offensive manner Possible. Mr. William Buck (the Mayor's brother) going out of the little north door was stared at by Mr. Whitfield, who being asked if he had anything to say to him, replied, 'No!' that 'his family was a pack of scoundreles, rogues, and villains,' and that he 'was one of them;' and forthwith seized Mr. Buck, shook him by the collar and kicked him; and Mr. Lake, the Town Olerk, coming up, Mr. Whitfield went to him and gave him a violent blow in the face with his fist. All this caused a very great hurry in the Church, some wept, others fainted, and the whole congregation was put into the utmost confusion and distraction. This is but one instance of the many that can be produced of Mr. Whitfield's unhappy disposition in taking opportunitys on Sundays to affront and defame his congregation in the Church; sometimes he spitts on them and calls them scoundreles and the scum of all mankind from the desk, at other times (and very often too), his discources are crouded with the severest invectives and defamatory expressions, such as villains, miscreants, rogues, worthless men, fools, stupid men, and the like, and these uttered with a particular energy of expression seem to be designed for little else besides abuse; and your petitioners who attend Divine Service with a sincere desire of doing their duty, and receiving instruction, are oftentimes sent away unable to perform the one, and with very little of the other. Your petitioners are very sorry they should be obliged to lay this matter before your Lordship as it cannot fail to give both trouble and concern, yet they hope for your favourable indulgence, and that your Lordship will take the whole into your consideration, and give such directions, as that your petitioners may not be reduced to the sad

necessity of absenting themselves from Divine worship. And your petitioners shall ever pray, &c.

"Bideford, 30th July, 1765."

"GEO: BUCK, Mayor.

"Jⁿ Bartlett
Tho^s Smith
W^m Tyett
J. Pitty
Tho^s Arscott
J^{no} Reid
E. Wren
Henry Young
Rob^t Wren
Rich^d Greering
Henry Cole
Thos. Copplestone Junr
Cha^s Rogers
Josias Wren
W^m Halls
John Lloyd"

E. Smith, Justice
John Saltren
Rich^d Blinch, D^y Recorder
W^m Buck
W^m Strange
Tho^s Kenney
Saml Horwood
Jno Shapley
Sam^l Banbury
Ja^s Hopkins
John Strange

Bishop Keppel, through his secretary, appears to have asked Mr. Whitfield for an explanation of his singularly unclerical behaviour, as described in the petition, and the rector sent the following answer :

"S^r

"I am favoured with yours and render you an immediate reply. I request you to present my Duty to the Bishop, and to assure him, I receive his orders with great and due respect. What effect his Lordships directions have on the Complainants, is what I am at present to attend ; but here do give under my hand, that the assault on Sunday Senight was upon me, not by me, that lies are their right of Birth, and that I would open further to his Lordship but that my future defence must be my first consideration.

"I am S^r your very humble Serv^t

"J. Whitfield "

"Bideford 6th Aug. 1765."

Endorsed

"For M^r. Nicholas Geare

At his house in

Exeter "

I am unable to say how the matter ended, but it is devoutly to be hoped that Mr. Whitfield got on better with his congregation subsequently, since he remained with them for nearly twenty years longer. His successor, William Smith, was instituted upon his death, 13th October, 1783.

Another rector of Bideford, who has been already incidentally mentioned, John Walhopp, instituted 11th January,

1420–21, at once declined (30th of the same month) to admit any burials in his churchyard, in consequence of the interment therein of one Matilda (relict of John Hooper), who had committed suicide by hanging herself. There is a note of this in Bishop's *Lacy's Register* (vol. iii. fol. 3), and the circumstance has been mentioned by Dr. Oliver. Bishop Lacy was very zealous in finding out churchyards in his diocese which had been desecrated by the effusion of blood or in other ways, and invariably insisted upon their reconciliation; and the provision of the episcopal fees for the performance of this function fell upon the parishioners, and were, I believe, rather heavy. However, upon this occasion the Bideford folks appear to have demanded and obtained an enquiry into the alleged desecration, and upon an inquisition it was found that Mrs. Hooper was notoriously insane, and that, therefore, no sufficient cause had existed for suspending the burials. The same Bishop (30th April, 1455) recommended to the charitable consideration of the faithful, one John Carrek, a married man, of Bideford, and a prisoner of war: "Nuper per inimicos Dⁿⁱ Regis Anglie in mare capti."

Dr. Oliver expresses anything but a complimentary opinion as to the past efforts of Bideford churchwardens in the matter of ecclesiastical decoration. He says:

"The parish church is dedicated to St. Mary, and, situated on a gentle rise from the west end of the bridge, is a pleasing object; but it was startling as we approached to behold a doric portal knocked up to lead to a north gallery, to view fluted granite columns tumbled out of the church, and broken up to serve for the gate-posts about the cemetery—and such fantastic doors, windows, &c. ! We were prepared for a worse interior, and for patchwork, and detestable, outrageous attempts to convert the appearance of the house of prayer into that of a lecture-room or theatre; nor were we disappointed. Thank heavens, they have overlooked the ancient font! but the monumental effigy of Sir Thomas Grenville,* Knight (whose family were benefactors to the south or Jesus Aisle, and where mass in honour of the name of Jesus was said every Friday out of Easter for benefactors to the bridge), they have managed to hide away with pew work and choke with lime dust. How comes it that churchwardens forsooth should delight in aping the myrmidons of Cromwell?"

My Bideford readers will probably exclaim, "We have changed all that now;" and I am aware that the time-worn and interesting church of their fathers was rebuilt, with the

* Notice his direction as to his burial in his will. He died A.D. 1514. (*Grenville Genealogy, ante.*)

exception of the tower, about twenty years since. I believe, also, that the curious and interesting Norman font, referred to by Dr. Oliver, with its rude cable moulding, has found a fresh position in the new structure. But was the rest of the work effected in that conservative spirit in which the re-edification of such a venerable structure should have been undertaken and accomplished? I say nothing about the actual building; but did the brackets, nodi, and corbel heads, the fragments of carved oak and stone, and other remains of curious detail with which our forefathers loved to adorn their temples, find a place in the new erection? I much fear that they did not. I shall be only too glad to be contradicted on this point; but I have great reason to think that even more than "fluted granite columns were tumbled out of the church" when it had become so ruinous that it was obliged to be pulled down in 1862. It was with much concern and regret that I observed the remarks, with which I am about to conclude these notes, in an article, under the head of "North Devon Jottings," which was published in an Exeter paper on Tuesday, December 14th, 1880. The writer says:

"While speaking of science and art just now, I intended to mention that I have recently come across some valuable specimens which came into the possession of the owner in a very curious way. Some twenty-five years ago there was fixed in Bideford Church, on a bracket in Mrs. Buck's pew, the bust of a pretty boy set in oak. Soon afterwards, when the church was restored, the builder, a Mr. White of that town, as is usual, removed a lot of material which he or somebody else considered to be valueless, and among the things removed was this head of a boy. He had it placed with a heap of mixed articles and rubbish in the back part of his house or in his cellar, where it remained several years. About two or three years ago Mr. White died, and in the sale of his goods this figure was included. It was then in a dirty state, and looked hardly worth carrying away. However, there happened to be among the company at the sale a Mr. Friendship, a tailor of Bideford, and his wife, both of whom have a fine appreciation of art, and take a great interest in old relics. The figure was put up at 5s., the biddings slowly ran up to 11s., and eventually it was knocked down to Mrs. Friendship for 18s. On taking it home Mr. Friendship unsparingly washed the figure with soap and water, and after the most persevering trouble he brought to light a beautifully modelled and painted representation of a boy in a wonderful state of preservation. He discovered that it was made of old terra cotta, and was set in oak. Thinking he might make a pound or two by it, he placed the article in his window. So artistically was the figure executed that a friend of his, while

walking along on the other side of the street, said, while looking at the figure, 'What a pretty boy that is in the window; I didn't think Mr. Friendship had one so young.'

"Mr. Friendship at one time had £3 offered him for the work, and at another time £9, both of which sums he for some unaccountable reason refused to accept. Ultimately, however, on examining the figure again, Mr. Friendship found at the back the name of Donatello, painted in clear black letters. Knowing that Donatello died over 400 years ago, his interest became excited, and not long afterwards he discovered that the figure was that of John the Baptist. It had the camel's hair about it, and every indication that it was really the work of a great artist. To make assurance doubly sure, he communicated with those who were better judges than himself. Mr. Wallace, of South Kensington, paid Mr. Friendship a visit, and, after a minute inspection of the figure, he offered Mr. Friendship the modest sum of £600 for it. But no, it is still in Mr. Friendship's upper room, surrounded by all sorts of quaint and antique treasures. Mrs. Friendship has a strong conviction that she ought not to part with the figure for less than £1000.

"She says that there is a Donatello School being got up in Florence; and, as there is no duplicate of such a figure in England, Florence ought to have it back again. Her theory is, that Sir Richard Grenville, who fought the Spaniards, brought the figure here from Rome, and gave it to Theobald Grenville, who was then the rector of Bideford. She believes it to have been used as an altarpiece. Mrs. Friendship is willing to part with it, but not below its value, and truly says that it ought to belong to a national institution. It is curious that the figure should have been in Bideford Church unknown so long. Were it even now erected in some Cathedral hundreds would be found who would go to see it. Mrs. Friendship humorously remarked to me, that she thought she laid out her 18s. to advantage. I may add that Donatello, or Donato di Belto Bardo, as was his full name, died on 12th December, 1466. The same owner has also the head and bracket of Theobald Grenville, beautifully carved in oak, a fine head of Richard Grenville, and several pieces of splendid oak carving, all of which came from Bideford Church. Two long lengths of six feet each are especially fine, and are supposed to be by *Grindley (sic)* Gibbons, who was celebrated for his fairy tracery and foliage. She has also the cover of the font which Cromwell's soldiers carried out of the church, and made their swine eat out of; the Grenville crest, and a handsome Prince of Wales' plume which came from the old guildhall. To those who take a delight in these things Mrs. Friendship's curiosity room would well repay a visit."

So I should suppose. But if this account is correct, I fancy that the sooner a committee is formed in Bideford to regain possession of the ornaments of their church and the heads

of their patrons the better, to say nothing of the font cover, which I presume was only regarded as a dilapidated article of furniture. Some years since I was standing in Holne Church, and looking admiringly at the pulpit, which is not only enriched with beautiful perpendicular carving and chromatic decoration, but which also contains the whole history of the erection of the sacred structure in which it has stood for more than 400 years in the heraldic shields on its panels, when one of the parishioners remarked, "Looking at our old pulpit, sir? Well, he's nearly worn out surely; us have sim'd a long time that he ort to be ripped up now, and us have been a thinking of gathering the parish for a new one, like thickey into Ashburton; but then a large place like that *would* be sure to have a better one than us should, of course."

Many of my readers will remember the hideous mahogany erection in the latter parish, and may have heard how very well contented are the people of Bigbury with the ancient example of perpendicular work which it supplanted, and of which they became the fortunate possessors, together with the "eagle" or lectern, in the year 1777, by purchase from the Ashburton wardens for the sum of eleven guineas.

I find no mention of the name of Theobald Grenville amongst the rectors of Bideford, so that Mrs. Friendship is probably wrong in the idea that the figure of St. John the Baptist in terra cotta, by Donatello, was given to him for his church by his kinsman, Sir Richard, upon his "return from Rome after fighting the Spaniards."

THE COURT ROLLS OF THE
MANOR AND BOROUGH OF PAINGTON, DEVON,
WITH SOME NOTES ON THE TENURES OF THE MANOR.

BY JNO. LANE, F.C.A.

(Read at Newton Abbot, July, 1884.)

THE manor of Paington in very early times belonged to the See of Exeter, from which, by royal requisition, Bishop Veysey conveyed it to the Earl of Pembroke. He sold it in 1644 to Sir Henry Cary, from whom, by an intermediate party, it passed to John Kellond, Esq. On the death of Charles Kellond Courtenay, Esq., his co-heiresses brought it to the Earl of Cork and Mr. Poyntz, from whose representative it passed by purchase to the Templer family,* in whose possession it still remains.

It may be well to note at the outset that the mode of spelling the name of this ancient town varies. In the text of Blewett's *Panorama*, just quoted, it is spelt Paignton, while in the topographical map at the commencement of the volume it is in two places spelt Paington, which is undoubtedly the older, and, the writer assumes, the correct form. In *Domesday* book (p. 102) the spelling is PEINTONE.† The old records, court rolls, and muniments have, as will be hereafter seen, the spelling almost invariably Paington; the exceptions being Peinton, Painton, Paynton, Payington, and (more frequently) Paignton.‡ It is a fact worthy of record, that, notwithstanding the modern form of Paignton being generally used, yet, in the official records of

* BLEWETT'S *Panorama of Torquay*, 2nd edition, p. 233.

† The ancient name of the manor in the time of Edward the Confessor was *Peintone*.—LYSONS' *Mag. Brit. Devon*. lxxiv.

‡ *Trans. Devon. Assoc.* 1878, vol. x. p. 225. "Paynton," quoted in document, date 1625. *Ibid.* p. 303, "Paignton—pen, a head"?

the manor, and in the court rolls, surrenders, and admittances, the spelling is to the present day continued Paington.

It is much to be regretted that the first volume of the court rolls of the manor is not in existence. The earliest book is marked "Liber B," and commences 15th September, 1664. The book is in a dilapidated condition, and is now known as vol. i. It contains the records of the Courts Baron and Courts Leet held in and for the manor and borough of Paington, together with enrolments of the various surrenders passed and admittances granted from that date to the 12th April, 1706. During the whole of that period, and for a considerable time afterwards, all surrenders were made and passed in court before the steward and the homage or jury. These courts were generally held half-yearly, frequently in April and October. The modern practice is quite the reverse, as no surrenders are made in Court, but before two free-tenants out of court. These free-tenants at the time, or on some other day subsequently, deliver the surrenders by a peculiar form and custom into the hands of the steward, who thereupon grants admission to the purchaser.

The holding of any court now is merely formal, and sometimes at intervals of several years, the functions originally exercised by the Court and by its officers having passed into other hands.

The manor itself was very comprehensive in its holdings and tenures. Until the middle of the seventeenth century a considerable part of the lands in England was held by *knight service*, either of the king *in capite*, or of other superior lords. This tenure (which was abolished by 12 Car. II. c. 24) carried with it the incidents of relief, primer seisin, wardship, livery, aid for knighting the lord's eldest son and marrying his eldest daughter, fines for alienation, and escheat. The residue of the lands in England was divided into the three tenures which subsist at the present day; viz., free socage (which, with the lands held by knight service, were alike denominated frank tenements), pure villenage, and privileged villenage, or villein socage.

Socage tenures seem to have been relics of Saxon liberty. Their grand distinguishing characteristic was in having their services ascertained, and they include all methods of holding free lands by certain, determinate, and invariable rents and duties. Tenure in burgage was one kind of socage tenure.

Since the Act of Car. II. the only services incident to lands of socage tenure are fealty, suit of court, quit rents, relief, and (occasionally only) heriots.

A manor seems to have been a district of ground held by a lord, who kept so much of the lands in his own hands as was necessary for the use of his family, called *demesne lands*. The other or *tenemental lands* were distributed amongst the tenants, and were distinguished by two different names. First, *boc-land* or charter-land, which was held by deed under certain rents and free services, and in effect differed nothing from free socage lands. From these have arisen most of the freehold tenants who hold of particular manors, and owe suit and service to the lord. The other was *folk-land*, which was not held by any assurance in writing, but distributed among the common folk or people at the pleasure of the lord, and resumed at his discretion, being land held in villenage, and the tenant was termed a villein. Villeins could acquire no property, either in land or goods, nor leave their lord without his permission; and if they ran away or were purloined, might be claimed and recovered by action, like beasts or other chattels. They held indeed small portions of land by way of sustaining themselves and families; but it was at the mere will of the lord, who might dispossess them whenever he pleased.

These villeins, however, in process of time gained considerable influence over the lords; for the good-nature and benevolence of many lords of manors, having, time out of mind, permitted the villeins and their children to enjoy their possessions without interruption in a regular course of descent, the common law, of which *custom* is the life, gave them title to prescribe against the lords; and on performance of the same services to hold their lands, in spite of any determination of the lord's will. And although in general they are still said to hold their estates "at the will of the lord," yet it is such a will as is agreeable to the custom of the manor, which custom is preserved and evidenced by the rolls of the several courts baron in which they are entered. As such tenants had nothing to show for their estates but these customs, and admissions in pursuance of them, entered on those rolls, or the copies of those entries witnessed by the steward, they began to be called tenants by copy of court roll, and their tenure itself a copyhold.

The extracts from the Court Rolls hereinafter given will, I think, show that the manor of Paington included tenements held under each of these tenures; viz.:

1. Free tenures, or free socage.
2. Tenure in burgage, and
3. Tenure by custom, or by copy of court roll.

And they all appear to have been holden, as they still are held, of the lord of the manor, "at the will of the lord, according to the custom of the manor and borough aforesaid by and under the rents and services for the same due and of right accustomed."

A description here of what at one period was included within the manor of Paington will indicate its comprehensive nature. It is from a deed dated 10th July, 1654, and is as follows:

"All that the Lordshippe Mannor and Burrough of Paington als Peinton in the sayd County of Devon with all the rights members and appurtenances thereof And all the Advowsons & Vicaridges of the Churches of Paington als Peinton & Stock Gabriell in the sayd County of Devon. And all that the Key of Paington als Peinton Key and the Greene Sellers and Pallaces thereon standing and thereto belonging. And all the wasts and Pfitts thereof and of every pte and peell thereof And all and singular freehold Leasehold and Coppyhold Messuages Granges mills millhowses and all other howses Edifices buildings Cellers Pallaces Barnes Stables Dovehouses Orchards Gardens Curtelages Lands Tenent^s Meadows feedings pastures Comons Demeasne lands Wasts heathers moors marishes fenns woods vnderwoods waters watercourses fishinges Rivers Warrens mines quarryes rents reu'cons and services as well of ffree as of customary Tennts of Inheritance Leaseholders and Coppyholders for term of life And all rents and services reserved uppon any demises or graunts of the sayd Manng^r and p^rmisses or any pte thereof by Coppy of Court Roll or otherwise ffee farmes Tythes Tenthes Annewities Knightsfees Wards Marryages Escheats Releifes herryotts ffynes Amerciam^t Courts Leets, viewes of ffrankpledge Co^rts barron, proffitts of Court Barron and Leets, Chattles wayved estrayed goods and chattells of ffelons and fugitives ffelons of themselves and persons put on Exigent, Deodands, Estovers and Comons of Estovers, freewarren Wrecks of Sea Jetson flotson and Legan, Customes Marketts fayres Tolles rights Jurisdiccions Royalties ffranchises priviledges And also ffree ffysHINGE in the Water and River of Dart adioyninge or lyinge against the Villages and Lands called Ash, Stoke Gabriell and Sandridge And alsoe ffree fishing in the Deep Sea against Paington in Torbay and uppon Paington Sands proffitts comodities Emoluments and hereditam^{ts} whatsoeu^r of what nature or kinde soeu^r the same bee or by whatsoeu^r other name or names they or any of them are or may be knowne named or called scituate lyinge and being comeing groweing renewinge or happening or ariseinge within or uppon the Townes Pishes fields Hamletts or p^rcinets of Paington Stoke Gabriell Compton Marledon and Kingcarswell or any or either of them in the said County of Devon to the said Manno^r Burrough Advowsons of the Vicaridges of Paington and Stoke Gabriell or

to any of them then belonginge or apperteyneinge or as pte pcell or member of the sayd Manno^r or Burrough then had accepted reputed demised used held occupied or enioyed as part or pcell or member of them or any of them.* "And also all that the Markett of Paington Tolls and Standings with all the appurtennces & hereditam^{ts} whatsoever."†

To every manor having freehold tenants a *Common Law Court Baron* is incident, of which the suitors are the judges so far as relates to any suits pending there. The steward of the manor is a constituent part of the court, and as such is a judicial officer. There is also incident to every manor having copyhold tenants a *Customary Court Baron*, for those only who hold by copy of court roll. The Court Baron is a court of civil jurisdiction, and was ordained as well for the maintenance of the services and duties stipulated for by lords of manors on their granting out lands to others in fee, as also for the purpose of determining actions of a personal nature, as debt or trespass, &c. This court was of two natures, the one a customary court appertaining entirely to the copyholders, in which their copyhold estates were transferred by surrender and admittance, and other matters transacted relative to their tenures only; the other was a court of common law, the court of the barons, by which name the freehold tenants were sometimes called, who owed suit and service to the manor.

The Court Leet (which might be appendant to a manor) was a court of criminal jurisdiction. It is a court of record, and one of the highest and most ancient tribunals of the common law. Its original intent is stated to have been to view the frankpledge, or freemen, within the liberty, hence called the "View of frankpledge." All offences cognizable in the leet were enquired of and presented by suitors of the court, duly sworn, and charged as a jury for that purpose, and consisting of not less than twelve.

The Court Baron is frequently held simultaneously with the Court Leet, and then the various acts are referred to the court to which they respectively apply, and where there are both freehold and copyhold lands within the manor the proceedings of the common law and customary court baron may be entered on the same roll (*Scriven*).

At the Court Leet of the manor of Paington, a Reeve, and also a Hayward, were appointed, in most instances on present-

* It is said that the lords of the manor could formerly inflict capital punishment. (LYSONS' *Devonshire*, p. 382.)

† The market has been disused for many years. (See LYSONS.)

ment by the former holders of those offices. An Aletaster was appointed for Paington and another Aletaster for Stoke Gabriel, which at that period formed a parcel of the manor.

A Homage was appointed for the Court Leet and sworn, whilst for the Court Baron jurors were appointed and likewise sworn. The homage varied in number, as evidenced by the Court Rolls, from 2 to 7, and the jurors from 12 to 23.

It was the duty of the homage and of the jurors in their respective courts to make presentments of the deaths of any of the free, customary, or conventional tenants, stating the next heir, and (where due) the heriot belonging to the lord, also as to any disputes, damages, nuisances, defaults, or encroachments on the manor, whether done or suffered, or omitted to be done or suffered by the lord or by any of the tenants who owed suit and service to the manor. Many of these presentments are curious and interesting. Those I have extracted would fill a small volume. I propose to give here such of them only as appear to afford most information as to what the customs of this manor were two centuries ago.

The first presentment recorded in vol. i. (Liber B) is of the 15th September, 1664, and is as follows. Court Leet.

Paington Mannor	}	Cur mannerii redibus tenta decimo quinto die Septembris Ano Regni dni nri Caroli ⁱⁱ sedi Regis Anglie &c decimo Sexto, 1664.
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Homagne ibm	}	Stephey Necke Jur Willm Proffitt Jur Gabriel Tomlyn Jur Edw ^d full Jur
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Reeve		William Adams p'sent Gilbert Dustin to be Reeve for the next ensuinge yere
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Heyward		William Churchward p'sented by Hugh Smyth
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Paington Aletaster	}	Stephen Hill came & p'sented John Efford for brewinge sixe times since lady day & John Champlyn for bwinge five times & p'sents James Langler to be Aletaster.
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Stoke Gabriel Aletaster	}	William Heyward
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Imprimis, they p'sent all the tenants that made default.

Item, they p'sent Josias Adams for building of a howsee at Aysh in Stoke Gabryell & inclosinge of an Orchard upon the Royalty.

Item they p'sent that there came two white yeo sheepe wch came into the lands of Stephen Neck about Ladyday last past.

The Law Court, or Court Baron, was held two days after the Court Leet in this year. In some years the Courts appear to have been holden together. The entry is as follows:

Paington. Cur Legalis Mannij & Burgi p'd ibm tent decimo septimo die Octobris Ano Regni dni nri Caroli scdi dei grac. Anglie Scot ffance & hibne Rg fidei defen^r &c xvj^{to} Annoq Dni 1664.

Jurat ¶	{	Clement Mathew	{	Jur	} Jur
dino Reg		Gabriel Jackson		Jur	
		Allan Penny	Jur		
		Elaze Phillyps	Jur		
		Thomas ffurneaux	Jur		
		Wm Adams Sen de Ash	Jur		
		John Tomlyn of Polsham	Jur		
		John Churchward	Jur		
		Thomas Harradon	Jur		
		Nicholas ffowler	Jur		
		William Holle	Jur		
		David Lane de Stoke	Jur		
		John Efford	Jur		
		Hugh Tapley	Jur		
		Eliz Ryder	Jur		
		Richard Berry	Jur		
		William Hellinge	Jur		

Reeve Gilbert Dustin.

Heyward William Churchward who came and for refusinge
fine xx^s to be sworne & execute his office is ffyned xx^s

Paington } James Langaller who came & was sworne for
Aletaster } this yeare ensuinge.

Stoke Gabriell } David Horswell who came and was sworne for
Aletaster } this yeare followinge.

The Jurors } Impr. they psent all free tenants that have made
aforesaid p'sent } default this day of suit of Court.
as followeth }

Itm they p'sent the Towne Well in Stoke Gabriell to be in decay
but to be repaired by the paishoners.

Itm they p'sent the death of John Miller the which died since
the last Court, and Elizabeth Miller his daughter to be his
next heire the rent to the lord is 10^d being the 4th pt of
3^s 4^d

Itm they p'sent the default of a Pillory, Stocks, & Cucking
Stool.

1664. October 17. Court Leet.

The Homage doe p'sent the default of those Tenants that ought to have appeared this day & did not & referr themselves to the Stewards Roll.*

1665. April 18. Law Court, or Court Baron.

Reeve Gilbert Dustin who came and was sworne to doe the office for this yere followinge.

Heyward William Churchward for a further contempt in not executinge the office is again ffyned at xxx^s

Aletaster de } James Langaller, who came and p'sents Alice
Paington } Greene, John Champlain, Julian Mediat,
 Thomas Harradon, Jane Goodridge, Susan
 Stabb, John Efford, Margery Hutchings,
 Dorothy Downinge, & Henry furneaux to be
 Comon brewers of Beere & ale who came &
 entred their ffyne & paid 3^d a yeere to this
 court for lycence wch is given & soe they are
 each of them to pay xx^d a yeere at Michmas
 next.

Aletaster @ } David Horswell who p'sents John Churchward,
StokeGabriell } Margaret Miller & George Moore to bee
 brewers who came & entred their ffynes for
 lycence to brew & are to pay to the Lord of
 the Mannor at Michmas next xx^d a yeere for
 wch entry each of them paid 3^d accordinge to
 the custom of the Burrow aforesaid.

1665. April 18 (same as last). Court Leet.

Homagne } Gabriel Tomlyn Will^{us} proffitt
ibm } Will : Churchward Ed^{was} ffull
 Willus Yabbacombe

absentinge to serve as an Homage is fined 2^s viij^d

Imprimis they p'sent the Tennts that made default.

Item they p'sent that one white yeo & one white weather came into the custodie of William Drew of Wester Land † very lately.

Item they p'sent that one white weather about five weeks sithence came into the land of William Churchward & there remaines.

Item that one white ram about four months sithence came into the lands of Elizabeth Mathews & there remaines.

Jurat ꝑ domi } Imp^s they p'sent all the free tennts that owe
Rege p'sent } suit of court and have made default this day.
ut sequite }

* There is no evidence of such a roll now in existence.

† Wester Land, now Westerland, is a hamlet of Paington.

Itm they p'sent the death of M^{rs} Mary Davis & who died since the last court, & the next heire they know not.

Itm they p'sent the death of John Maskings who died since the last court John Maskings his sonne to be the next heire, the reliefe is the quarter of the rent.

Itm they p'sent one white weather which came upon the lands of John Drew of Occombe * as a Straer [strayer] in November last. They p'sent one white yewe sheepe which came uppon the lands of Thomas ffurneaux about three months since.

1665. October 2. Law Court and Court Baron.

John ffurneaux for opposinge & disturbinge the Court is fined x^s

The same John ffurneaux for againe (notwithstanding hee was often forbidden) opposinge & disturbinge the Court is ffined xxx^s

They p'sent the death of Grace Lane the wife of William Lane who died seized of a close of land called Ramslade with th'app'tennces lyinge in Stokegabriell and that John Lane their sonne to be the next heire to the said Grace, relieffe $\frac{1}{4}$ ^d

Here are three complayners to Thomas Heyward land of Stoke Gabriell & they shew us noe president for it, therefore wee cannot find the right heire, but that William Heyward is the right heire to the said Thomas Heyward one house burgage.

1666. April 17. Court Leet and Court Baron.

The p'sentmts of the free inquest att the Court Leete of Paington given in the 17th day of Aprill in 1666.

Itm they p'sent the death of Susanna Emmett who died sithence the last law day but who is next heire they know not. they p'sent James Emmett next heire.

They p'sent Nicholas ffowler for stopinge & abborring of a Drange or passage betweene Margaret Hingstons howse & his att the pollinge † end of her howse.

Nicholas ffowler being now in p'son in Co't refuseth to enter his traverse, or to take a day for repayinge & amendinge the passage & incroachm^t is therefore am'ced vj^s viij^d

1666. October 23. Law Court and Court Baron.

Thomas ffurneaux for disturbinge the Court is fined 20^s

* Occombe was a tenement in the parish of Marldon.

† "Pollinge end," (?) "punkin-end—the gable end of a house."—Couch, *History of Polperro*, 1871.

Disturbes the Court again, fine 20^s

Andrew Little for speaking approachfully [reproachfully] of the Court is fyned 6^s 8^d

P^resentmts } They p^rsent all the tennants that have made de-
of } fault this day. Concerninge the clayme of
the inquest } Hewards land they leave it as it was before.

They p^rsent the death of Robert Kinge and Gilbert Kinge to bee the next heire but doe not know of any lands that hee dyed seized of.

They find Thomas Heyward seized who granted the lands by Coppy dated the 13 day of Aprill 22 Car. primi,* to Dewnes Torringe her heires & assignes for ever and that Dewnes Dyer & Joane Kinge Widdow to be her next heires.

1666. October 23rd. Court Leet.

They p^rsent Edward full in the right of his Wife for sufferinge his Wall adioyninge to the chimney of William Adams to be fallen down. Ido in m^r [misericordia].

1667. September 26. Court Leet.

Item they p^rsent the death of Edward ffoster a customary tennt of this mannor and that happeneth to the Lord of the mannor two best Beasts that he dyed possessed of and find Susan his wife the Relict to be Tennt for the p^rmisses that hee dyed possessed of accordinge to the custome of the mannor duringe her widdowhoo^d† & soe shee is sworn & admitted Tennt accordingly.

Also they p^rsent the death of Alice full the wife of Edward full & that there happeneth to the lord of the mannor the best Beast for a Herriott but who is next tennt or in the lord's hand they know not.

They find to be Reeve for this yere ensuinge Sibilla Efford ‡ for her Tenement.

1667. October 17. Law Court or Court Baron.

Reeve Sybilla Efford who came not Ido upon her head xxx^s

The p^rsentments of the free inquest att the law court att Paignton held the day & yeare aforesaid.

* This is the earliest mentioned date, and would be found in Liber A.

† The right to "Freebench, a widow's dower in a copyhold," did not obtain in this manor.

‡ The first record of a woman as Reeve of this Manor.

Also they p^rsent that Richard Thorne late of Tormohan whom they were informed came after night riding over Goodrington Sands in this Pish was found dead in a leate of water in or near the said Gorrenton sands in the said Pish of Paignton but what goods hee had about him they know not wch said Thorne was found dead the nyynth day of October last past.

Note that the Horse wch the said Thorne ridd upon over the said sands was a nagg of a dark Iron'gray color wh Stephen Necke affirmes by the informacon of George Cole servant to the Lord Ridgway qy [query] John Venninge of Presten about the said horse who took the same into his custody.

1667. October 17. Court Leet.

Also they p^rsent the death of Robert Jeffry who dyed sithence the last Co't here held being a convenconary tennt But what happeneth to the Lord for a herryott upon his death they know not, but are informed the p^rmisses hee held are fallen into the Lords hand.

1668. March 26. Law Court and Court Baron.

Reeve Sybilla Efford who came not ideo sur le caput.

1668. March 26. Court Leet (same date as preceding law court).

Homagn ibm.

Nō appear to make a jury.*

1668. September 17. Court Leet.

Reeve Sybilla Efford came and the Homage find Katherine Drewe to be Reeve for the yere ensuinge & patience Ryder to succeed in case Katherine Drew dye.

Itm They p^rsent & say that they have bine informed that there was a peece of Timber driven on Shoure uppon the Sands neare Paignton Key.

1668. September 29. Law Court and Court Baron.

Aletaster de Paignton	}	James Cole appeares & putts Henry ffurneaux, Margery Hutchings Nicholas Chatwill & Humfry Bolt upon their ffynes to pay xx ^d a yeere at Michaelms next and hath paid iij ^d p each entry and p ^r sent Daniel Goodridge & John Stabb to be comon brewers who refuse to be att their entry and further sayth that for the yere past they have each of them brewed tenn times each And further saith that Susan the wife of the foresaid John Stabb refuseth to give a tast of her Ale & Beere. Ido.
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* Consequently there were no presentments.

Item they p^rsent a certain Bridge lying neere the howse of John Lane in Paignton Towne wch ought to bee repaired by the inhabitants of the said Burrough & towne of Payngton.

1668. September 29. Court Baron and Court Leet.

Bayleiffe * of the }
manner } Hugh Smyth who appears.

Att this day came Anne Tomlyn the wife of Gabriel Tomlyn deced was sworne & admitted tennant for a Tenem^t with thapp^rtennces lyinge in Preston and hath paid for her admittance j^s & accordinge to the custom of the mannor abovesaid.

1669. April 27. Law Court and Court Baron.

Itm they p^rsent the death of Alling Peny who died sithence the last law Court & his sonne William Penny to be his heire qy w^t lands.

Itm they p^rsent one ewe & lambe wch came as Strears uppon the lands of Otho Tully.

Itm they p^rsent the death of David Lane who died sithence the last law court who past a surrender to Elizabeth Hallamore before hee died see needs noe comp^t.

Itm they p^rsent the lord of the mannor for not reparing of the pound.

1669. April 26. Court Leet.

Itm they p^rsent the death of Alce Drewe Vid. a customary [†]Tennt of this mannor who dyed since last Court and that there happened to the lord of the said mannor for a Herryott a best beast.

Itm they p^rsent the death of Hugh Smyth another conven^t [†]tennt of this mannor who dyed since last Court here held Uppon whose death there happened a best beast And that Anne his wife is next Tennt who is not yet sworne.

1670. October 19. Law Court and Court Baron.

Aletaster de Payngton. David Barnes who for neglectinge the execucon of his office beinge sworne is fined iij^s iiij^d.

Itm they p^rsent the death of Henry Webber & that John Webber who is beyond the sea, if living, is next heire for
_____ contg about 3 ptes of an acre.

* The only instance of the Reeve being designated a Bailiff.

[†] "Customary Tenant" and "Conventionary Tenant" here seem to be identical.

Itm they p'sent the death of Thomas Philp who made away his land by surrender since last Court.

Itm they p'sent the death of Andrew Churchward & James Churchward his sonne to be the next heire for a howse & applegarden herbgarden & little close of land Burgage in True street.

1670. April 19. Court Leet.

Itm the finde Johane the wife of the said John Churchward to bee next Tennant accordinge to custome duringe her Widdowhood who ought to be att this Court to be Sworne & admitted but is sick.*

Itm they p'sent the death of Thomas Philpe als Marten a conventionary Tennant of this mannor who dyed since last Court here held possessed of one Seller neere Painton key wch is now fallen into the lords hand but what to the lord for a herryott they know not.

Itm they p'sent Susan ffoster for corrupting & defiling of a certain pott water in the orchard belonging to her Dwelling howse whereby John Mathews & Samuel Mathews are much dampnified.

1670. October 25. Law Court, Court Baron, and View of Frankpledge. The title or heading to the entry of this Court contains for the first time the phrase, "View of frankpledge." It is of frequent occurrence afterwards.

Paington. Cur legali & visu franc pleg. & cur mannerij Johis Kellond, Armigeri, ibm tent xxv^o die Octobris Ano Regni dni nri Caroli Sedi Rege Anglie &c. xxij^o An^o Dni 1670.

1671. April 25. Law Court and View of Frankpledge.

25^o die April.

1671^o. The p'sentmts of the grand inquest.

Itm they p'sent the Toun Well wch is in decay wch ought to be repaired by the parishioners of Paington.

Itm they p'sent the Bridge that is adioyninge to John Lane his howse to be in decay & that it is to be repaired by the pishoners of Paington.

Itm they p'sent the death of Henry Cholditch and doe finde by the oath of Avis Butby his sister who was in ffull court sworne & examined that she the said Avis being now the wife of John Butby of Stepney in the County of Midsex, Vitler, is next heire to the said Henry Cholditch to whom his lands ought to descend.

* She came, and was admitted at next Court, 25th October, 1670.

1671. April 25. Court Leet.

Itm wee p'sent James Langaller a customary Tennant of this mannor for sufferinge his Barne to be very ruinous & much in decay and also his other howses.

1671. September 19. Court Leet.

Impris they p'sent the default of the freetenants, convencionary tenants & customary tenants * that did not appeare at this Co^rt

1671. October 3. Law Court and View of Frankpledge.

Itm they p'sent William Burrige & Joane his Wife uppon the oath of Toby Bennfeild for keepinge back a surrender from her sonn Thomas Cheadder. Whereuppon it is ordered that the same be deliv^red & brought into Co^rt to be next holden Spa iij^a iiij^d

Item they p'sent the pishioners of Payngton for sufferinge a certaine bridge lying in Winner street to be ruinous & in decay to the great damage of his Maties leige people & also of the neighbours the water that runes under the said bridge beinge corrupted Whereuppon a day is given to the said pishioners untill the feast of the birth of our Lord God next, uppon payne of 6^s 8^d pen fforisfact.

1671. October 3. Law Court and View of Frankpledge.

Paington †

Itm they p'sent William Burrage of Brixham & Jane his Wife for not bringing of a Surrender into court accordinge to custome they standing both formerly p'sented Subpa iij^a iiij^d wch is forfeited And it is ordered that the said surrender be pemptorily brought in at the next Court. sup^a x^a

1672. October 7. Law Court and View of Frankpledge.

Reeve Anne Tomlyn

Heyward John Churchward appears

Aletaster cf } David Barnes who came & for not pforminge his
Paington } office being thereunto required, ideo in miseri-
cordia xxvj^a viij^d

Aletaster of } David Horswill who came not ideo in miseri-
Stoke Gabriel } cordia

* Free-tenants were the holders of free lands under certain fixed rents or services. Conventional tenants were those who held lands or tenements under reserved rents for life leases. Customary tenants held their lands and tenements by custom, or by copy of court roll, and were sometimes termed copyholders. The tenants of the manor, at the present day are, and for many years past have been, designated free-tenants, irrespective it would seem of the origin of their tenures or holdings, and they are chiefly, if not entirely, copyholders or customary tenants.

† The spelling is invariably Paington, after this date.

Itm they p'sent Margaret Miller who dyed sithence the last Court day being a free burrough * tennant of this Court

Itm they p'sent the death of Thomas Sexson another free Burr. tennt who dyed sithence y^e last Court day and they find John Sexon his his [sic] son to bee his next heir but to or for what lands omis ignor.

1672. October 7. Court Leet.

Itm they p'sent Johane ——— of Shorton† Widdow to bee Reeve of the mannor aforesaid for the yere 1674.

1673. April 1. Law Court and View of Frankpledge.

Heyward Willus Blackford for not returning a full inquest‡ ideo in m^{ria} [misericordia] xiiij^s iiij^d

1673. April 1. Court Baron and Court Leet.

Also they find that sithence last Court held there was a certaine mast driven into Goodrington Sands in this parish by Storme wch doth pyteyne to the Lord of the Mannor & Burrough as wreck, who claymes the same by pscriptcon wch said mast is now seized into the hands of the Lord of the Mannor, and remains in the custody of the said Lord as his own pper goods.

1673. September 15. Court Leet.

Reeve William Grendon Reeve next yere. Joane Adams the yere 74 & 75—the Lord for Jones Mathews Tenement. John Toope old.§

1673. October 13. Law Court and View of Frankpledge.

Heyward Willus Yabbacombe who being p'sented to the office last court came now and was sworn to do the Office this yere ensuinge. Att wch time William Blatchford made default of payment of the ffynes wch should have bine collected last yeare idio m^{ria} 26a. 8d.

Itm they p'sent George Langver who p'tends to hold an Estate Burgage lyinge in Polsham in the right of Ellen his wife, lately called Ellen Drew, for not shewing & p'ducinge their copy to this Court touchinge a controversie between Joseph Blatchford & them, for wch offence they the said George Langver and Ellen his wife ought to be fined accordinge to the custome of this Borrough.

* First record of a free borough tenant—freetenant.

† Shorton, a hamlet of Paignton. Note this appointment made a year in advance. See 15th September, 1673, "Joane Adams."

‡ Notwithstanding the default of the Heyward, sufficient jurors were present, and the grand inquest made the ordinary presentments.

§ These entries appear to be somewhat mixed, and of doubtful meaning.

George Langver is for the offence aforesaid fined *xiijs iiii^d*
 This copy was hereuppon p'duced whereuppon by 2d. rent
 was inserted to the Lord.

1674. April 22 to 1677 May 22. All the entries are in Latin.

1677. October 28. Court Baron and Law Court, View of Frankpledge and Court Leet.

Item they p'sent Richard Ware of Blagdon within this manner for encroaching the whole streame of water & diverting the streame of water which usually & heretofore adsum from a field called Gatcombe now in the possession of William Stabb by two little streams into a comon highway called Whiteley lane, one streame whereof did usually & ought to run into a field called Laberance late in the possession of Patience Rider deceased and now in the possession of John Kellond, Esq., the other part whereof ought to run into a field of the said Richard Wares called Gabbadon upon the evidence of Gilbert Gibbs John Toope and others.

Item they p'sent the Tenement called Bodd's Tenement, scituate in West'and [Westerland] now in the possession of Sir Andrew Tolwell p his undertenants for being ruinous and in decay to the value of Thirty Shillings, upon the oath of Gilb' Gibbs.

1678. April 28. Law Court, Court Baron, and Court Leet.

Item they p'sent the Lord of the mannor for defect in the Pound Wall.

Item they p'sent the death of Elinor ffoster the wife of ffoster who dyed seized of a Sellar att Paington Kay and that it fall into the hands of the lord of the mannor.

1677. December 20. Law Court, Court Baron, and Court Leet.

Imprimis the Jurors for our lord the Kinge

. . . P'sent the death of Mrs. Mary Wise the Wife of Mr. John Wise who dyed since the last Court & finde Mary Wise their daughter to be the next heire.

Homagers—

The Jurors aforesaid upon their oaths p'sent a Capston which is driven ashore att Gurrington Sand (within the pcincts of the mannor of Painton).

1678. October 2. Law Court, View of Frankpledge and Court Baron, and Court Leet.

Paington Cur leglis vis ffranc pleg & cur Baron Johis Kellond, &c.*

Item they p'sent the pishoners of Paington, Stoke Gabriell, and Marledon for sufferinge the Cucking Stooles to fall in decay.

Item they p'sent George Jackson William Smyth and William Tarring of the pish of Stoke Gabriell for selling of Beare and not paying their ffine to the lord.

Item they p'sent the lord of the mannor for not givinge them licence according to the custome.

Item they p'sent James Cole the Aletaster of Paington for not givinge his attendance to the Court.

Item they p'sent Robert White as an Inmate liveing with Anne Belfield vid. in Yalborne† within the pish of Paington.

1679. October 20. Law Court, Court Baron, and Court Leet.

Item they p'sent the death of John Toope & that there is a herriott due to the lord, & Wilmote Toope is his Executor.‡

1679. October 7. Law Court, View of Frankpledge and Court Baron.

Item they p'sent the pishoners of the pishes of Paington Stoke-gabriell & Marledon for not repayinge their seru'all cocking stooles.

Item they p'sent the Beere sellers of Paington Stokegabriell & Marledon for not paying their ffine to the lord.

Item they p'sent the lord of the mannor for not givinge them license accordeing to custome.

Item they p'sent the Reeve of Preston§ for not appearing to this Court.

Item they p'sent William Weekes for makeing an Incroachment upon Phillip Champlin's land by setting up of ffrith between the herbery & the orchard.

* The words "& cur Baron" appear to have been subsequently added, the ink being paler.

† Yalborne, now Yalberton.

‡ This is the first instance of the word "Executor," and is evidently intended to signify "heir." It does not occur again.

§ Preston, a hamlet of the parish of Paington, was a separate manor known as the Manor of Preston or Pruston Rectory. The constant occurrence of the name of a person as "Reeve of Preston," at the end (generally) of the list of Jurors, coupled with this presentment, would indicate that it was the duty of that officer to attend the Paington Courts. See also 1713, November 5th.

1680. April [date blotted over]. Court Baron and Court Leet.

Item they p'sent the pshioners of Paington Stokegabriell & Marledon for not repayingr their Cucking stoole, vist Paington one half & Marledon & Stokegabriell the other.

Item they p'sent John Screech for not giveinge notice of his brewinge to W^m Dust the Aletaster.

Item, lastly they p'sent the lord of the mannor for not p'vidinge a Strayer p'ke belonging to the pound.

Item they p'sent that the Jurors att this Court are to view the Bond Stone att Bowhith Lane & to retourne their Verdict the next Court.

1680. September 15. Court Leet.

Imprimis they p'sent the death of William Blackford thelder a Convenconary Tenant & that William his son ought to have the rev'con.

Item they p'sent the death of Clement Necke a convenconary tenant and that Johane his. Widdow ought to have the revercon.

Item they p'sent Richard Toope to be Reeve to collect the rents * for one year to commence Michaelmas 1680.

1680. October 14. Law Court, View of Frankpledge, and Court Baron.

Imprimis the Jurors aforesaid upon their oaths p'sent all such tenants as doe owe suite & service to the Court & who havinge had lawfull warninge † have yet made default.

Item they p'sent the pshoners of Paington Stokegabriell & Marledon for not repayingr their Cucking stoole, Paington being att half the charges thereof.

Item they p'sent Nicholas ffowler for making a nusance by erectinge a new wall & house against the dwellinghouse of Richard Hutchings to hinder the lights of the said house since the last Court.

Item they p'sent Matthew Necke for making an incroachment in the King's highway att Blagdon Sale.

Item they p'sent Thomas Drew for sellinge his beare & refuseinge to lette the Aletaster taste it.

* Duties of Reeve. This is the first instance of the Reeve's duty being defined. See also 1683, Sept. 15. It is a fact that the collection of the Borough rents constitutes the whole of the Reeve's duty at the present time.

† There is no evidence to show what this "lawful warning" was.

Item they p'sent the lord of this mannor for not p'videinge a Strayer pke to the pound.

Item they p'sent John Reach the Aletaster of Stokegabriell for the year past for not attending this p'sent Court & not p'senting another Aletaster for the yeare ensueinge.

1681. April 17. Court Baron and Court Leet.

Item that as to Boweth Lane the Bond Stone to be removed & to be sett up betwixt the lands of the lord of this mannor & one Mr. Osborne.

1681. September 13. Law Court and Court Baron.

Item they p'sent the lord of the mannor for want of a locke & gate to the pound of this Mannor.

Item they p'sent the lord of the mannor aforesaid for want of a Tytheingman.

Item they p'sent the lord of the said mannor for want of a cucking stoole to the said mannor.

The next entry is on a page by itself, and apparently in the writing of Henry Penny, his signature with those of the attesting witnesses being original.

1682. January 20th

Whereas in the month of October last past I Henry Penny of Paington in the County of Devon Yeoman did take up and seize some few peices of broken planke and one peice of tymber on the Sands called Goodrington Sands within the said Pish of Paington Driven a shore as wrecke by the said Sea there against the Lands of mee the said Henry Penny And whereas I have been sued in his Ma^{ties} Court of Excheq^r by John Kellond Esq who claymes the same and the Wrecke of the Sea there I doe hereby desire all further prosecution against mee to cease and doe declare that I secured the same not in my owne right but will on demaund deliver the same boards and Tymber to the said John Kellond or his Servaunts and doe herewith pay all the charges att law against me. As witnes my hand the Twentieth day of January 1682

In presence of

Henry Penny

Giles Yarde

Edw. Searle

Jo. Waymouth

1682. May 1. Law Court and Court Baron.

Imprimis the Jurors aforesaid upon their Oaths p'sent Gabriell Jackson for makeinge of Ineroachment upon the land of Andrew Cratie to be viewed by Jur.

Item they p'sent the lords powne for want of a gate & locke

Item they p'sent the pishes of Paington, Stoke Gabriell & Marledon for want of a cocking stoole & Tittheingman

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Item they p^rsent the pishes of Paington for not repaying it.

Item they p^rsent Edward Codner for sufferinge his Bullocke to wander about the high wayes.

1683. April 9. Law Court and Court Baron.

Item they are alsoe agreed as to the custome where two surrenders are taken for one estate that the first surrender shall stand and that Thomas Docrowe ought to have the Estate past from Thomas Butland for the plott, and att the rent of iiij^d thereon reserved, nothwithstandinge it is alleadged that it was formerly iiij^s & ij^d rent.

1683. September 15. Court Leet.

Item they p^rsent John furse to be Reeve for collecting the Rents of the Mannor * for one yeare from Mich : next to Mich : 1684 to be sworne the next Law Courte and to take his rental att Mich : 1684.

Item they p^rsent John Halswell in right of his Wife to be Heyward for the p^rclayminge and cryinge the Court * and to collect the flynes Releifes and amerciam^{ts} of the Mannor for one yeare from Mich : law Court next and then to take on him the Oath and office.

1683. October 11. Law Court, View of Frankpledge, and Court Baron.

Item continuant p^rsentmentu p non pvidend Abacu (Anglice, a cuckinge stoole).

Item continuant p^rsentmentu p non pvidend a Tytheingman Richus Dowman, fforeman. †

1684. October 15. Court Leet.

Item they p^rsent John Tulley the elder to bee Reeve to collect the Rents † for the Lord from Mich: last untill Mich: 1685.

Item they p^rsent Alice Webber Widdow to bee Heyward for one yeare from Mich: last past.

Item they p^rsent Alice Webber (beinge a customary tenant) for setting her estate to tillage without lycence of the Lord, being contrary to the custome of the Manno^r upon the oath of John Yeabecombe.

1684. October 19. Law Court.

Item they doe continue the p^rsentment of the Cuckingstoole.

Item they continue the p^rsentment of the Lord of the Manno^r for not pvidinge a tythingeman in Gorrington.

* These, and under 1680, September 15th, are the only entries at all indicating the duties of Reeve and Hayward.

† The only instance of a presentment being signed, or of the mention of a Foreman.

1684. October 19. Court Baron and Court Leet.

Item they p'sent Timothy Tookerman for a busings the Lord in his Royalty as to the Game.

Item they p'sent Alice Webber beinge a customary Tenant for livinge of [off] from her Estate contrary to the custome of the Manno^r aforesaid.

From this date Courts were regularly held, but there is no enrolment of any other presentment in this vol. i. (Liber B), which ends with an entry of 12th April, 1706, and the next entry of a Court is in vol. ii. date

1713. November 5. View of Frankpledge and Law Court.

Imprimis they p'sent and continue all former p'sentments that are not repaired amended sattisfied & agreed for & doe p'sent all such persons that weare duly to appeare att this Court this day and have made default.

Wee p'sent the death of Mary Berry of Payington & doe find Anne Rapson her sister to be her next heir.

Wee p'sent the death of Allen Penney of Paington and doe leave the determination of the next heir to the next Court that wee may be better informed of the Custome by the Court Rools or P^rsidents.

Wee p'sent the death of George Marwood of Dittisham but wee doe leave the determination of the next heir to the next Court to be better Informed, because of the contest between two Cozens Jermans and an Aunt upon a Mortgage surrender.

Wee p'sent the Reeve of Preston for not appearing & serving on the Jury this day whereby wee could not bring in our p'sentm^{ts} according to the Custom of the Burrough.

1713. November 5. Court Baron and Court Leet.

Wee p'sent John Horsham for his howse being in decay and doe give him untill the next Court for Repairing the same and If not repair'd wee doe fine him 5^s

1714. April 13. Law Court and View of Frankpledge.

Wee p'sent the death of Allan Penney of Paington but leave the determinial of y^e next heir to the next Court that we may be better informed of the Custome by y^e Court Roles or Presidents.

Wee p'sent the death of George Marrwood of Dittishame but leave the determination of y^e next heir to the next Court to be better informed of y^e custome by the Court Rools or Presidents.

1714. April 13. Court Baron and Court Leet.

Wee p'sent all conventionary Tennants that have made default
Here this day fine 6^d

Wee continue y^e p'sentment against John Horsham for his house
in decay & not repaied & fine him ten shilling.

1714. October 4. View of Frankpledge and Court Baron.
Leet.* Leet.

[Here follow the names of thirteen jurors, who are for the
first time described as "Mr."]

We p'sent y^e Death of Alan Penney & find to be his next Heir
Alan Penney his granchild.

We p'sent y^e Death of George Marwood of Dittishame & leave
the Determination of the Heir to y^e next Court.

We p'sent y^e Tything Man's prison called ye Stocks being out of
Repair.

1714. October 14. Court Baron and Court Leet.

Mr. John Horsham's House is in repair.

1716. April 12. Court Leet. (This is the last entry of a
Court being held in which presentments were made.)

We p'sent Thomas Methier for Deniale of y^e Way to goe to
Hannah fflowlers by y^e Oath of Theade Adma.

We p'sent y^e plott of Ground to y^e Western end of John finche's
house to be his

We p'sent Stephen ffoot for Taring doun of y^e Bonds of y^e s^d
-plott

We p'sent y^e Death of Allan Penney & find Allan Penney his
Grand Son to be his next Heir.

By y^e Oath of John ffurneaux we p'sent John Taylor for carry-
ing off y^e Stones that belong to y^e Lords from y^e Key fine 5^s

We continue y^e p'sentment against Sarah Smyth† for felling the
Lords Timber & fine her 5 shillings.

This is the last presentment, and my task is done; but I
cannot conclude without gratefully acknowledging my in-
debtedness to the courtesy of the Steward of the Manor
(Charles H. Eastley, Esq.) for permission to make searches
amongst the old Manorial Records, and to take and use such
extracts therefrom as I might consider desirable.

* The only instance of the word "Leet" so used in these Court Rolls.

† There is no previous presentment on record against Sarah Smyth.

SOME NOTES ON THE EARLIER MUNICIPAL HISTORY OF PLYMOUTH.

BY R. N. WORTH, F.G.S.

(Read at Newton Abbot, July, 1884.)

THE history of Plymouth may be conveniently divided into three sections: (a) Prehistoric and Legendary, extending down to the compilation of *Domesday*; (b) Uncertain and Fragmentary, dating from *Domesday* down to the incorporation of the existing borough by Act of Parliament in 1439; and (c) Consecutive, from 1439 onward to the present time. Of the second section, which covers upwards of 350 years, we know probably less than we do of the history of any town in England of equal importance over so long a period. There is but one single contemporary document among the Corporation archives within its range, though there are copies of several others, and there must once have been many. Probably the bulk perished when the "towne's evydyence" was destroyed by fire in an assault of the Western Rebels in 1548. And yet during these three centuries and a half Plymouth grew from a mere fishing hamlet to a port so famous that it took a principal part in the wars of the Edwards against France; that it was the rendezvous of a fleet of 325 ships in 1287; that it stood third on the list of contributories to the Calais fleet in 1346; and that in 1377 the poll tax returns assign it an assessed population of 4837, which would give a total of nearly 10,000—a number exceeded at that date in this kingdom only by the cities of London, York, and Bristol.* I do not attempt, however, in the present paper to consider

* The fact that a grant by King John to Alice, Countess of Warwick, to remain a widow during her pleasure, is dated at Sutton, by the hand of Hugh, Archdeacon of Wells (January 13th, 6 John, 1204), may point to one of the earliest connections of the town with national affairs.

the relations of Plymouth to the general national life, but rather to weave the threads of its early municipal history into as consistent a web as possible, in the hope that I may obtain additional light from other sources upon what are confessedly very obscure conditions.*

We start with sufficient precision. *Domesday* records Sudtone (Sutton) as being part of the king's demesne, and appendant with Macretone (Maker) and Tanbretone (King's Tamerton) to the manor of Wachusetone (Walkhampton), the original head of what is now the hundred of Roborough.† Sutton was a small manor with land for six ploughs, with twenty acres of pasture, two of meadow, and worth 20s. a year, and its population is enumerated at one serf, four villeins, and two bordars. It was bounded on the west and north, as Plymouth is now, by Stanehvs (Stonehouse), the property of Robert the Bastard; and Stoches (Devonport), the property of Robert of Albemarle, whence its parochial name of Stoke Damerel. On the east its limits are not so clear. There were two manors of Modlei, which are identifiable with the modern Higher and Lower Mutleys—one of Contune (Compton Gifford), and one of Lisistone (Lipson), concerning all of which there is really no room for doubt. But in addition to these there appears among the fiefs of Judhel of Totnes a manor of Leuricestone, which stands in the record between the Mutleys and Weston Peveril, and which, I am compelled to hold, was one of the estates that lay contiguous to Sutton. The probability seems to be that as there have been recognized two Lipsons—Higher and Lower—Leuricestone has merged in the one, as Lisistone in

* Nor do I here in any way deal with the nature and position of its presumed Saxon predecessor—Tamarworth.

† An important element in the consideration of the early history of the town, which I can only hint at here, is the fact of the existence down to a comparatively late period of traces of the ancient holding of the "mark," indicative of Teutonic settlement. This was first stated by myself in 1882 (*Trans. Plym. Inst.* vol. viii. pp. 196, 197), when I called attention to the occurrence of several references in ancient deeds touching properties in Plymouth, to "landscore" land, the point that seemed conclusive being that a certain field, which retained a very mixed and complicated ownership to the present day, was "lyinge in landscore." Since then other vestiges of this ancient tenure have come to light; and I find that what was known in Plymouth by the name of "landscore" was a strip of unenclosed land, and that a teneiment which lay in landscore consisted of a series of these unenclosed "scores" or "shares." Such tenements are traceable in every quarter of the borough. One which was enclosed in the latter part of the seventeenth century went by the name of "Roper's piece." Of one landscore by the Laira the dimensions are given. It consisted of 136 yards of land at 36 feet the yard.

the other; but I have thought it also likely that the original limits of Leuricestone included what is now the Cattedown district of Plymouth, and even that its title may be compounded of that of the estuary of the Lary, and of an ancient name of this rocky headland—Hingstone. It seems clear at any rate that Cattedown and the land between it and the Lipson creek formed no part of the manor of Sutton; nor of Lipson, as now understood; though it does of modern Plymouth. Moreover, we can trace the history of every one of the Domesday manors, and account for them at the present day under their original names, with this single exception, unless Lipson is read; and it is precisely in the area that I have supposed Leuricestone to cover that we in later days find other manors existing, which certainly were not carved out of Sutton, or out of any other ancient manor in the neighbourhood, if we reject Leuricestone, and which, if that hypothesis is not accepted, cannot be found represented in *Domesday* at all—the manor of Radclyffe and the reputed manor of Sutton Pill, which is only mentioned in comparatively recent years; and in part probably the manor of Ulyetts, or Lulyetts Fee, or Lulyetts Parke.

Lulyett's Fee was held in the early part of the 17th century (of which period its manor court book is extant among the archives of the Plymouth Corporation) with a parcel of the manor of Lipson, and occasionally called "Ullett cum Lypson." The entries of properties show that it adjoined the modern Lipson on its eastern border, and extended south to what was anciently Sutton Prior, while Sutton Vautort certainly joined it on the west—Sutton Prior and Sutton Vautort or Vallertort being the two parts into which, somewhere in the twelfth century, the original manor of Sutton was divided. There was a third division bearing the Sutton prefix, but that was the *tything* of Sutton Raf; and this tything I identify to some extent with the manor of Radclyffe, which belonged in the reign of Henry VII. to the Edgecumbes. It may in part have been connected with Sutton proper; but records of manor courts of this and of subsequent reigns show that Radclyffe lay in the east of the borough (the position assigned by Leland to Sutton Raf) for one of the tenements was "Saltram Mill," while closes of land at Saltram are also mentioned; and this is shown to be the present "Little Saltram" by the description in a lease of the same period as being in the eastern part of Plymouth. The more modern Sutton Pill, which I take, in part at least, to represent Radclyffe, included portions, if not the whole, of Cattedown.

Sutton and Leuricestone practically therefore make up municipal Plymouth.

Domesday in no way bears out the statement of Leland that "The chirch and much of the ground whereon Sutton now caullid Plymmouth was builded was longing to one of the Prebendes Titulo S. Petri and Pauli of Plympton, a collegiate church, alias *Capella libera dni Regis* before the Conquest." Sutton is set forth in the Great Survey as solely the king's; and the only entry that in any way could seem to favour Leland's view is that Robert the Bastard, who held Stonehouse, had two villeins in the land of the canons of Plympton. This, however, when closely examined proves nothing to the point. On the other hand there is good evidence of the date when the manor of Sutton was first alienated by the Crown. This led to its division; and that again to its attainment—indirectly—of municipal rights in the peculiar form which the history of its local self government assumed.

An Inquisition taken at Exeter before Salamon de Roffe and his associates, justices itinerant, on the octave of St. Martin 9 Edward I. (1281) sets forth *inter alia* that the manors of Sutton, Maketon (Maker), and King's Tamerton *cum filo aque de Tamer* were ancient demesne of the King, but had been given by Henry I. to Roger [elsewhere called Reginald] de Valletort by the service of a knight's fee and a half—that John de Vautort then held the manors of Sutton and Maketon, and Elias de Blakeston that of King's Tamerton, while Edmund Count of Cornwall *tenet filum aque* it did not appear by what warrant. And John and Elias came and said that they and their predecessors had held these manors before the time of Richard the King. The Abbot of Buckland held Buckland Monachorum, Bickleigh, and Walkhampton and the hundred of Roborough; while Robert Gyffard (whence Compton Gifford) held the manors of Egg Buckland, Compton and Haueknol (Honicknowle).

Moreover it was presented that the ville of Sutton belonged to the Prior of Plympton, with assize of bread and beer, and this right was allowed. The Prior claimed that these liberties had been enjoyed for many years, by charter of the lord Henry (Henry III.) father of the lord the King that then was.

Here is the first mention of Sutton as a ville, and it is thus evident that it must have assumed the status of a town in the modern sense somewhere in the earlier part of the thirteenth century. We shall note incidental proof of this as we proceed.

The succession of the Valletorts has never, so far as I am aware, been clearly made out. A Reginald de Valletort was, however, the most considerable Norman under-tenant in the neighbourhood at the time of the *Domesday* Survey, and held at that date both Lisistone and Macretone, with several adjacent manors, of the Count of Moreton; and the grant of Sutton was made in all probability to him early in the 12th century. The Prior of Plympton, it has been seen, did not date his claim to lordship of the ville earlier than the reign of Henry III.; so that the division of the one original manor of Sutton into the two subsequent manors, called after their respective lords Sutton Valletort (or Vautort or Vawter) and Sutton Prior, must have taken place somewhere between these periods. We cannot be much more exact.

Moreover the Priory of Plympton was refounded under the Norman rule by Bishop Warelwast in 1121, and if the collegiate church of Saxon times had no land in Sutton, it is further evident from this consideration that Sutton Prior must have originated subsequent to that date, at which time the undivided manor was in the hands of the King or of the Valletorts. So far as we can ascertain it seems to have been created wholly by the liberality of that noble house to the Priory, successive members making repeated grants, and thus gradually extending the conventual domains. The earliest of these now traceable is by Reginald de Valletort, of all his fishing rights, whether in Tamar or in Lynher, with the waters belonging thereto—*concurrentibus tractibus*—save and except the pool *sub aula de halton*. The copy of this grant in the "Black Book" of the Corporation of Plymouth is undated; but it was probably made not long after the manor passed into the hands of the Valletort family.

Still greater benevolence was shown by Ralph de Valletort, son and heir of Reginald, who granted to God and the church of St. Peter and St. Paul of Plympton and the canons there, in perpetual alms for the welfare of his soul and the souls of his ancestors and successors, a convenient place next Surepolam (*ad firmandum stagnum molendini et molendinum faciendum*) with right to erect a mill and mill dam, and all the mill toll of his manor of Sutton, with a suitable way thereto—that was to say by the corner of his garden of Sutton (*anglo gardini mei de Suthtona*) as anciently they were accustomed to go to the fishery of the canons at Surpole (*piscarium canonicorum de Surepola*).*

* Surpool extended northwards from what is now Millbay (so called from these very mills) over land long reclaimed.

This Ralph has been regarded as the grandson of the Reginald of *Domesday*, and as he was living in 1165 it seems likely that this was the case. The reference to the length of time during which the canons had held their fishery in Surpool would also appear to indicate that we are right in placing the grant of his father or grandfather very early in their ownership of the manor; for although there is an undated grant by John or Joel of Stanhust (Stonehouse) to the canons of free fishery *per totam terram meam*, Surpole, as an inlet from Millbay, has always been treated—though adjoining Stonehouse—as part of the Duchy rights under the honour of Trematon which the Valletorts held. Be this as it may, there are here two very important points. The grant gives to the Priory distinct manorial rights in connection with the mills at Millbay, which thereafter were appendant to the manor of Sutton Prior; and it shows that Ralph de Valletort made Sutton a place of residence. Nay, it even indicates to some extent the site of that residence; for the ancient road to Millbay from Plympton passed by what is now called Old Town Street, but in the middle ages was known as Old Town only, and is spoken of by Leland, under the name of Sutton Valletort, as the oldest part of Plymouth, but sore decayed. The point is important, too, as showing that in all likelihood the first real town in the modern sense at Plymouth grew up under the shadow of the residence of its Valletort lords.* It is to this date also that I am inclined to assign the origin of the division met with subsequently as the tithing of Sutton Raf [Ralph], which is treated as distinct from either Sutton Vawter or Sutton Prior, and certainly in part, as I have already shown, and as Leland states, lay in the eastern quarter of Plymouth. But the ancient ecclesiastical district of Plymouth was a very wide one, comprising not only the old town parish of St. Andrew, but the more modern parishes of Stonehouse and St. Bude, and the existing tithings of Compton and Weston Peveril; and it is impossible to say with precision what were the boundaries of the tithing of Sutton Raf. It seems to be used in the *Nomina Villarum* (1314) as wholly or partially synonymous with Sutton Vawter; and perhaps then expressed the Valletort interest in Sutton, at this time vested

* After much consideration concerning the *raison d'être* of the original Saxon Sutton, *South-town*, I feel tolerably certain that it must be associated with Weston [Peveril], *West-town*; and that the elder and more important settlement to which these places stood in relationship was at Stoke Damerel—the stocks or stokes being unquestionably places of exceptional importance as compared with the ordinary enclosure of the *tun*.

in one member of this family, as distinct from that of the Prior.*

In this record Sutton Rauff appears as belonging to John de Dalecurta, Burgus de Sutton to the Prior of Plympton; Tavyton, Compton, and Ekkeboeland to the Abbot of Tavistock; Mewy, Stok Damarle, and Efford to Ricardus de Mewy.

Walter de Valletort also gave the Priory the island of *St. Nicholas, cum can[al]iculus; (sic)* and probably there were other grants of which no records now remain. Only upon one occasion, so far as we are aware, was the harmony between the Valletorts and the monks broken, and that was when—in the middle, or more probably the latter part, of the twelfth century—a dispute arose between John de Valletort and the Prior of Plympton as to the right of presentation to the benefice of Sutton. The point was gained by the Prior, who claimed that his predecessors had exercised the right of presentation as early as the reign of William Rufus. But we may regard the Priory of Plympton as having been the one centre in late Saxon and early Norman days of the religious life of this corner of Devon, and the benefice as distinct from the manor of Sutton had a much wider field of operation, as we have already seen.† In after years we shall find Valletorts and Priors making common cause against what they regarded as Royal usurpations.

It was but a little later than this, if we may trust Leland (and unquestionably he had access to authorities no longer extant) that Sutton began to develope from the “mene thing as an Inhabitation of fischars,” which he recalls as its status in the reign of Henry II. (1154-89). He asserts that all who had built houses in Sutton Prior since the reign of that monarch took licence of the Priory of Plympton as their chief lord. The town, however, must have increased more rapidly than the “Litle and Litle” he assigns, or otherwise we should never find it in another century (1298) called upon to send representatives to Parliament, and in less than another four-score years the most populous port in the provinces, Bristol only excepted, and this notwithstanding repeated assaults and devastation by the French.

The establishments of markets are excellent landmarks of progress; and the first market grant for Plymouth was unquestionably made in the reign of Henry III., though

* Subsequently with two Valletort lords the distinction between Sutton Valletort and Sutton Raf would become natural and necessary.

† A patent, 3rd Henry IV., calls the living Sutton-Plympton.

the dates are somewhat uncertain. The Hundred Rolls of Edward I. state that the Prior of Plympton *habet libertatis ut assisas panis et cervisie et theolonea in villa de Sutton*, by charter of Henry III. Elsewhere the grant is said to have been made 38th Henry III. (1253) and to be of a Thursday market with a fair of three days at the festival of John the Baptist. Some fifty years since this charter was sought for on behalf of the Corporation but without success. In the forty-second year of the same monarch Baldwin de l'Isle had a grant for Sutton of a Wednesday market and a fair of three days at the feast of the Ascension. Henry's grant to the Prior was believed to have contained particular liberties. Baldwin de l'Isle is Baldwin de Redvers, the last Redvers Earl of Devon, lord of Plympton, who does not previously appear to have had any connection with Plymouth. We cannot believe that the two grants applied to the same place or jurisdiction, for they are made to two different authorities and in an inconsistent fashion. No town in those days of the size of Sutton would need a market two days following. Had the second grant been made to a Valletort in respect of Sutton Vawter, all would have been clear enough; and we should have been helped somewhat to understand certain apparent contradictions with regard to the market site, one of the spots alleged being within Sutton Prior and the other in Sutton Vawter. And as a reference to the Patent Rolls shows that the grant to Baldwin included manorial rights, possibly a dismemberment, if not a transfer, of Sutton Vawter was made in his favour.*

Year by year through the reign of Henry III. and the two first Edwards Sutton Prior continued to grow and flourish, until it either excited the attention of royalty, or the inhabitants sought to cast off the convent yoke. A movement commenced in the penultimate decade of the 13th century which never slackened long together for just 150 years, until its end was achieved. The inhabitants were determined to assert their independence and be kept in leading-strings no longer.

By writ from the King to the Sheriff of Devon, *circa* 1317, Nicholas of Cheigny, William of Chivelston, and Nicholas of Tewksbury, were appointed commissioners to enquire by a jury in the presence, if so desired, of the Prior of Plympton, John de Vautort of Clyst, and John de Vautort of Modeton, touching the property of the King in the town of Sutton, and a peti-

* Can Lulyett's be a corruption of L'Isle's? It certainly has a personal origin, and Courtenay rights were saved under the charter 1439-40.

tion by the burgesses of Sutton to be granted at a yearly rent certain waste places belonging to the Crown there. In opposition to this the Prior and the two Valletorts declared that the King had no lands in the town, and that he had no right to make Sutton a free borough and grant thereto a fair and market, the Prior being lord of two parts of the same town, and having a fair and market by royal charter, and the Valletorts being lords of the other third.* Further, that Sutton was within the hundred of Roborough, of which the Abbot of Buckland was lord. So the said Prior and the two Valletorts declared that the town was wholly theirs and none of the King's, and prayed the King not to grant franchise nor any other thing there.

Nevertheless upon an inquisition held before Robert Bondyn, Sheriff of Devon, at Exeter, "die dominica in festo Sancte Trinitatis anno regno Regis Edwardi ximo" [Edward II., 1318], on the oaths of John Gifforde, William Kemell, Walter of Colrigg, Vincent of Wyneston, Alan de Lydeton, John of Sergeuill, Thomas Collinge, John Adam, Robert Raffe, Ralph Cocke of Brendon, Martin the Clerk, and David Attewill, it was found that the kings of England before the foundation of the ville of Sutton had a piece of waste land near the port of Plymouth, five perches long and one perch broad; and a certain other piece of land *in retractio maris*—in the withdrawal of the sea—containing six acres of land, where a certain house of the town was built—at which places the King's ancestors by their bailiffs held their courts; and that fishing boats of the said ville and other places were accustomed to resort thither to dry their sails and nets, and expose their fish for sale—paying the King a rent of 12d. and a penny on each basket of fish there brought. Moreover, that the proceeds amounted to £4 annually.

This then shows the existence of a fishing village of Sutton to be long antecedent to the foundation of the town of that name; and it indicates moreover the existence of certain market rights in the King's demesne, prior to and contemporary with those granted to the Priory. The royal right, recognised by the jury are practically those which formed part first of the Earldom and then and now of the Duchy of Cornwall in connection with Sutton Pool—"the port of Plymouth" in its original sense.†

* At an earlier date it was the third that belonged to the Prior and the two thirds to the Valletorts.

† Edward II., in the eighth year of his reign (1315), granted Thomas de Genely the custody of the castle and town of Trematon, with "the water

Another inquisition, taken by Matthew de Clynedon in the same year, indicates more clearly the character of the proprietorial rights in Sutton, and locates the two main divisions. The town of Sutton was upon the coast of the port of Plymouth, but no part of it stood upon the King's soil. A certain portion of the town north of the said coast was upon the soil of the Prior of Plympton, and the Prior had assize of bread and ale and rents to the amount of £14 9s. 6½d., and so had had them from time immemorial, and there were free tenants. Another part of the town, south of the said coast, was upon the soil of John de Vautort, but the said John received nothing therefrom, save certain rents to the amount of £11 16s. 6d.; and his tenants did suit to his court twice in the year. In this part of the town the Abbot of Buckland had assize of bread and ale. The port of Plymouth belonged to the king, and rendered yearly £4 into the Exchequer; and Matthew de Clynedon found that it would neither prejudice the king nor any others if Sutton were made a free borough, and the inhabitants free burgesses, saving the service to the lords.

It is evident that the sense we must here attach to the words "Port of Plymouth," is "Harbour of Sutton Pool," otherwise the description, strained in any case, becomes absolutely unintelligible; for while Sutton Prior undoubtedly lay mainly to the north of this inlet, Sutton Vautort, though partially it might be regarded as south, was essentially west. And south of the port of Plymouth in any larger sense we have only the Channel. However, the way in which the word south is applied in this inquisition is clearly enough indicated, by the use of the phrase Southside of the immediate south-western border of Sutton Pool; and ancient deeds show that tenements here were comprised within the manor of Sutton Vawter.*

The rights of the Priors and their brethen were questioned on various occasions, but were always successfully defended, whether against the Crown or the Earldom and Duchy of

of Sutton; and subsequently in the same reign we find the town described as *Sutton villa super Costera Portus de Plymouth*. The "port of *Plymmue*" is mentioned as early as 1254. Edward III., in the fourth year of his reign (1331), granted Thomas Coppeare, valet of his chamber, the custody of the water of Sutton, as in the county of Devon, at a rent of £4; and in the following year repeated the grant as in the county of Cornwall.

* Sutton Prior was of course carved out of what was originally all Sutton Vawter by repeated grants; and essentially neither manor lay, in modern parlance, in a ring fence.

Cornwall, though the Convent had to submit to pay a fee farm rent into the Exchequer. John de Eltham, who succeeded to the earldom of Cornwall in 1328, claimed the fishery of the waters of Plymouth as ancient demesne; but a jury found that the privileges of the Prior and his tenants were conferred by the charter of Henry III. So in the time of the Black Prince there was another inquisition concerning the right to Sutton Pool; and here the Prior established a claim to certain quays, though the Pool proper continued to form a part of the Duchy estate. I confess that I have some doubts myself of the charter of Henry III. going much, if at all, beyond the grant of a market, and these repeated proceedings on the part of the Crown do appear to indicate some peculiarity in the title of the religious lords of Sutton.

The earliest reference to a governing body at Plymouth with which I am acquainted is the address of a writ by Henry III. (1254) to the bailiffs of the port of Plymouth (Plymmue), among others; but this general allusion is no absolute proof that any such authority existed. The first clear evidence that there was a local governing body is contained in a letter dated May 31, 1289, in which the *Bailiffs and Commonalty* of Plymouth write to the King that having been ordered to get ready a ship to transport men at arms and horses upon service, they had prepared the *Michel*, of Plymouth.

There are extant a number of writs addressed during the 14th century to persons in authority in Plymouth, which indicate still further the existence of the germs, at least, of municipal government. Then in 1326 the "Bailiffs of Plymouth, with the Port of Sutton," were directed to seize all suspected persons and letters; but this proves very little, for a similar writ was directed to the bailiffs of Yalhampton (Yealmpton) and of Newton Ferrars. Again, in 1344 the bailiffs of the "ville de Plumuth" were directed to send two inhabitants acquainted with shipping to London to advise the King and Council; similar directions being sent to Bristol, Hull, the chief Cinque Ports, Exeter, and Dartmouth, while Portsmouth was only directed to send one. In 1358 Walter le Venour, of "Plimmouth," and others, were ordered to detain three ships there and at Dartmouth, to transport Oliver, Lord de Clissons, and men-at-arms, to Brittany. It is worth notice that John Venour is elsewhere mentioned as mayor in 1377, so that it is at least possible that Walter occupied a somewhat similar office; and we know from other

sources that the family were of considerable local note. In the following year (1359) the bailiffs of Plymouth are directed, with others, to raise a subsidy of 6d. for the defence of the realm. In 1364 they are ordered to take steps to forbid the export of precious metals; and in 1372 the bailiffs of "ville de Plymouth" are the first mentioned in a writ addressed to the western ports to stay ships and men.

In 1369 the mayor and bailiffs are ordered to send two sufficient men to Westminster conversant with mercantile affairs. This was in October; and in the December following, the same, with Thomas Fishacre, John Sampson, and Robert Pilche, are ordered to provide ships and men for the defence of the realm. This is the earliest mention I can find of the office of mayor. In May, 1374, William Noytour, master of the *Trinity* of Plymouth, is ordered to come to London to advise the Council.

These writs to mayors and bailiffs and the like, are in addition to many others, either addressed to unspecified authorities, or to the collectors of customs and subsidies—as in 1347 to the collectors of subsidies in *portibus villarum de Plummuth*, and all other places upon the water of Tamar. From 1287, when it was made the rendezvous of a fleet of 325 vessels, which sailed under the Earl of Lancaster for Guienne, down to the date of the incorporation, in 1439, not a decade passed in which such writs were not sent to Plymouth on matters connected with the sea service (occasionally we may note them year after year); and its position in the West is clearly marked by two points—its sending 26 ships and 603 men to the siege of Calais in 1346, Fowey, Yarmouth, and Dartmouth alone exceeding it in the kingdom; and its supplying, in 1399–1403, 10 ships and barges to the service of the Admiralty, the highest number of any port in the entire list.

The "White Book" of the Corporation contains the copies of several ancient deeds made by a town clerk of the 16th century, because they mentioned the names of divers mayors of Sutton Prior and of Plymouth prior to the Act of Incorporation; with references to ten other "auncyent dedes . . . by the which it is manyfest that Sutton Pryors and sythyns by the nomynation of Kyng Henry the Sixte named the burgh of Plymouthe, was a town of auncyent name and hadd yerelie an officer chosen by the name of P'positus or Custos ville de Sutton Pryors, whiche then dyd rule and governe vnder the Kynge." These deeds were dated 8th, 10th,

and 16th Edward II., and 42nd Edward III. It is noticeable, however, that in the deeds actually recited the word mayor is almost always used, and that prepositus and mayor were by no means identical terms, though the offices were very much akin. The existence of a prepositus in Plymouth so early as the commencement of the 14th century is certain, for Richard the Tanner held that office for Sutton in 1310; but Maurice Berd, 1370, is the first *mayor* whose name has been preserved.

A few hints are given in records of grants of land by the Priory of Plympton. The earliest we have of these is by John [de la Stert], Prior of Plympton, 15 Edward III. (1342), to Robert, son of William the Spicer, of Sutton, and Alice, his wife, of a tenement in Billabiri Street, south of one belonging to William of Northcote, and extending sixty feet to the east to a way leading towards the market of Sutton, and a way leading from Bilbury Street towards the Oldtowne. The only other with a date is by John Prior of Plympton, 10th Richard II. (1387), to Ade Blogge, and Isabella, his wife, of a tenement at the hill in Sutton Prior, east of the stalls and south of the pillory, with survivorship, at a yearly rent of 36s. 8d. The undated grants are all in the name of John Prior of Plympton, probably de la Stert above. There is one of an acre and a half of land in Sutton, near Martock's Well, to Margery Stilman and her heirs; a second of an acre and a half *apud le heuedlonde*, north of the middle of the hyauedlond, to John of Stoke; another of an acre and a half near the heauedlonde, south of the middle, to Robert of Whitelegge; and a fourth of three acres and a half to William Berde, of Sutton, next the field held by William Cocke, and a piece of waste adjoining (*eodem wastu sub salistu maris*).

As William Berd was prepositus of Sutton in 1313, we have here some clue to the date of this last document. Again, John Austen was his colleague in the representation of Sutton in Parliament, and John Austen appears among the witnesses to Margery Stilman's grant. The grants of the land at the heauedlonde were apparently somewhat anterior, as the first is said to have afterwards been the property of Robertus Sope, who took to wife the daughter of John of Stoke; and Robert the Soper was member in 1310, as William of Stoke had been in 1298. The heauedlonde at first would seem to be represented by the field still called the Headlands; but that conclusion is negatived, not merely by the fact that this was part of the manor of Lulyett's Fee, but

from the entry, *Postea Robtus Sope qui duxit in uxorem fil Johis de Sok & vendidit terr in Cart que est sup la howe vbi molendinum ventritim Mauricii Prigge sit.*

The distinctive character of the divisions of those days is shown in the oldest deed at present in possession of the Corporation of Plymouth, 1381 (4th Richard II.). It is a release by William Okelegh, of "Plymouth," to William Wrouke of the same place, of a tenement and garden in "lo ward de Sutton Vautort." It is dated at Sutton Vautort, and witnessed by Robert Hill, William Honiton, John Bull, and others. This William Honiton is elsewhere named as mayor in this very year, but does not appear as such in the deed. A point to which attention may specially be directed here is the use of the phrase "lo ward de Sutton Vautort" * at this early date; for it is fairly equivalent to the division which afterwards existed for centuries under the Act-Charter—"Old Town Ward."

Some sort of independent action in the inhabitants was assumed and acknowledged definitely early in the fourteenth century; for market rights were acquired by the burgesses in 1311. In that year there was a final concord and agreement on the morrow of the feast of St. James, between the Prior and Convent of Plympton, and the Burgesses of the Commonalty of the town of Sutton, in the presence and by the

* Before the incorporation of the town the territorial divisions were of course proprietorial; but this phrase "ward of Sutton Vautort" naturally led to the inquiry how far the ward divisions of later days represented the earlier manors. Leland mentions the four wards of the town in his day as being Old Town, Venners, Vintry, and Lower; and this division is practically retained at the present day in the Land Tax assessment. There is no doubt also that it represents the original arrangement; for each ward had the care and defence of one of the four towers of the "castel quadrate," by which the town was defended. As the town grew the outer boundaries of the wards, which were purely urban in their character, would be modified; but there is no reason to assume any internal modification while the number remained unchanged. There is every reason to believe therefore that the old internal ward boundaries, which can be traced back to the 17th century, were practically those that had existed from the beginning, and that the division was made then, as it continued later, by drawing lines as nearly as the thoroughfares allowed east and west and north and south, intersecting at the point where the Free Library now stands. The manorial distinctions must therefore have been disregarded; for while Old Town did in the main represent Sutton Vawter, and Venner's Ward also in part, yet they both included portions of Sutton Prior.* Vintry, however, was almost wholly in Sutton Prior, the only exceptions that I know of being the premises at Southside, in Sutton Vawter; and Lower Ward, though certainly in later days consisting largely of Sutton Raf, must then have been chiefly representative of Sutton Prior likewise.

* Property in Old Town passed to the Corporation under the transfer of the manorial rights of the Priory.

mediation of the Bishop of Exeter, the Lord Hugh de Courtenay, Peter Abbot of Buckfastleigh, the Lord Thomas de Cilecestre, Knight, and others. A stone cross had been erected in a certain place within the borough of Sutton, and certain stalls for the sale of fish, flesh, and other victuals. These, with the Church of Sutton, are stated to belong to the Prior and Convent; while the burgesses had no right to erect others without license, which however they had done. The controversy is settled by the burgesses having let to them eighteen stalls, at 1d. each per year—to be paid on their behalf by the prepositus for the time being—and agreeing not to put up any more, either in that place or any other spot within the borough, without due license. As the burgesses had no seal, Richard the Tanner, prepositus, put his. Somewhere within the next half century, however, a corporate authority must have gained a more definite existence, probably in the division of Sutton Vawter, for a deed of 1368 has a seal with a ship for device, and the legend *S. communitalis ville de Sutton super Plymmoth*, a designation assumed, as we shall see, to be distinct from Sutton Prior. The deed is that by which Stonehouse is conveyed from the Bastards to the Durnfords, and the Commonalty of Sutton were sufficiently important to be called in as witnesses.

At length we reach more definite ground. Edward III., towards the close of his long reign, conferred upon the inhabitants of Sutton what was essentially a charter, and was so regarded. On the 24th November, 1374, he directed letters patent to William Cole, Stephen Durneford, John Sampson, Roger Boswines, Robert Possebury, Geoffrey Couche, John Weston, William Trevys, William Gille, Maurice Berde, William Bourewe, jun., and Humphry Passour, as burgesses of the borough of Sutton. Being mindful of the damage and disgrace that might happen to the town and the country adjacent by invasion of the enemy, in default of good rule, and being willing to provide for its defence and safety, and fully confiding in the fidelity of the men above named, the king assigns them jointly and severally to survey all defaults in the town and port thereof whereby dangers might arise; to procure the same to be amended; to cause the men of the said town to be arrayed, so that they should always be ready and prepared to meet their enemies; and to do and execute such other things as might be necessary to provide for the safety of the same town. Moreover the mayor and bailiffs, and all and singular

the inhabitants of the town, were to be obedient and aiding in the performance and execution of these premises.

It seems to me that we have here a recognition of the existence of the two rival divisions of Sutton Prior and Sutton Vawter. Had the mayor and bailiffs possessed full authority, the orders should have, in due course, been addressed to them; and as from other sources we gather that the twelve men named were inhabitants of Sutton Prior, the corporate body recognized in these letters must have had jurisdiction in Sutton Vawter, which had by this time escheated to the Crown. We shall see, however, that under cover of this quasi-charter, the effort was made to bring the whole town under one jurisdiction; and hence probably it was that in 1378 Richard II., for the purpose of fortifying the town (which was then in great danger, and not enclosed or fortified with walls or turrets or otherwise), made a grant of customs duties for the purpose to "the mayor, bailiffs, honest men, and commonalty," while in 1383 an order was directed in his name to the mayor and bailiffs against the exportation of provisions.

In 1384 we find William Cole, Thomas Fishacre, Geoffrey Couche, and Humphry Passour licensed by Richard II. to alienate six acres of land held of the King in chief to the Friars Minors; and three of these men, it will be seen, were of the twelve commissioned to take steps for the defence of the town under the letters patent of ten years previously.

In the same year, moreover, the Royal rights to toll of fish taken in the sea water of Sutton Plumpmouth, and Tamar, and sold in Plymouth, were enforced against certain fishermen, by whom they had been sought to be evaded.

All this points to definite action on the part of the Crown and of the inhabitants to bring the whole town under one municipal government; and it will be noticed that the name chosen to combine Sutton Prior and Sutton Vawter was Sutton upon Plymmouth, thence Sutton Plymouth, and finally, when union and incorporation were completed, the Plymouth without the Sutton as now.

Fortunately the records of the controversy between the Priors and their tenants have preserved for us a description of the old manorial government of Sutton Prior; and the most interesting notice of the early municipal history of Plymouth is contained in the finding of an inquisition taken by order of the King on the complaint of the Prior of Plympton, 8th Richard II. (1385). It was held at "Ekebok-

land," on the Wednesday next after the feast of the Holy Trinity, before Walter Cornu and Richard Gripston, on the oaths of Peter Whitelegh, Stephen Lautroun, William Wyneslond, Ralph Bytheyes, David Treweman, Richard Wylberton, Thomas Stanton, William Worston, William Lake, Thomas Boyes of Hareston, Thomas Cut, and William Godegrome. They found that the Prior of Plympton and his predecessors from time immémorial had been lords of Sutton Prior, and accustomed to hold a Munday Court with assize of bread and beer and weights and measures, with jurisdiction over transgressors, and authority over millers, bakers, butchers, sellers of wine and hydromel, and cooks, and those who made bread outside the town and carried it therein to sell. That in this Court, held by the Prior's Seneschal, at the first sitting next after the feast of St. Michael yearly, twelve tenants of the same Prior, in the said town, were sworn to determine and choose a Prepositus of the same Prior and town, and him so chosen to the said Seneschal immediately to present, whereupon, having taken his corporal oath before the said Seneschal, the said Prepositus should from that time forth of the said Court be head, receiving for the Prior all debts, amerciements, fines, reliefs, and perquisites of the said Court, and all other like profits of the same Prior at the same place well and faithfully collecting and levying; and immediately after the end of his year of office well and faithfully accounting for the same to the aforesaid Prior in the Priory of Plympton. Moreover, all other things to his office of Prepositus belonging, without favour he should do and execute, in all respects as had been accustomed, holding the sittings of the Court aforesaid under the licence of the Prior, and all else that a Mayor in the aforesaid town should do, or as had been accustomed from remote times.

And now (said the jury) Humphry Passour, cunningly and falsely plotting subtly to usurp the rights of the lord King and to make himself Mayor of the aforesaid town, instead of John Sampson, recently-chosen Prepositus—that is to say, in the Court held on Monday next after the feast of St. Michael last past, in the said Court elected, presented, and sworn to the said office—him to amove, and the said Prior and Church of the apostles Peter and Paul of Plympton maliciously to disinherit in this part, the aforesaid John before the lord King and his Council of divers offences and misdemeanours assailed and accused. Moreover, under cover of a certain brief of the lord King to the bailiffs and honest men of the said town of Sutton Prior by the name of the town of "Sutton Plymp-

mouth," certain burgesses of the said town Humphry Passour to the office of Mayor of the same town chose and elected, admitting him as such and obeying him in that office, and themselves to him in all things touching the said office submitting and obeying, whereas they would not allow the said John to enter and exercise his office. And in the King's Chancery the said Humphry Passour fraudulently, under colour of the brief of the lord King, sought to set himself in the mayoralty of the said town without the Court of the Prior, not being chosen before the Seneschal of the aforesaid Prior (whereas the mayoralty of the town with the Mayor of the same ought not so to be allowed to be); and the removal of the aforesaid John from the office and exercise of the said Prepositure he procured and made, and the same office of Mayor, without sufficient authority and warrant, he for a long time has occupied and at present occupies—that is to say, from the feast of the Conversion of St. Paul last past; and John Martyn, the Seneschal of the said Prior, he has prevented from holding the Monday Court by force of arms from the aforesaid feast; and has held it himself without the licence of the said Prior by his own authority, exercising all the rights of the said Prepositure, and up to this time has continued to do and perpetrate other enormities and injuries, and as many and as grievous deeds as lay in his power. And further the jurors aforesaid say under oath that never was there Mayor in the aforesaid town of Sutton Prior before the aforesaid feast of the Conversion of St. Paul last past, neither ought there so to be, nor used there to be but a Prepositus until the day when the aforesaid Humphry caused himself to be chosen Mayor of the aforesaid town of Sutton Prior.

If this finding be strictly accurate, then, as we find mayors of Sutton mentioned nearly twenty years prior to the enquiry, it follows that they must have been mayors of Sutton Vawter. The absolute accuracy of the finding is, however, not quite certain; for the term mayor had been used of the chief officer of Sutton Prior antecedently to that date, though of course it may have had no authority. John Sampson, the prepositus, will be noted as one of the twelve, put in commission with Passour.

The proceedings did not end with the inquisition; for in 1386 we find Passour rejoining in defence of his right to the mayoralty that at various times during the reign of Edward III., and during the reign of the present King, for the space of twenty years, mandates had been sent both under the King's privy seal and by his letters patent to the mayor of

the town, under the name of the mayor of the town of Sutton Plymouth, and had thus appointed the inhabitants to have a mayor. However, judgment was given against Passour and his friends, "because it has not been the custom for a mayor to govern in the town of Sutton Prior."

The point to be specially noticed throughout this controversy is that everything turns upon Sutton Prior, and that no judgment is given in respect of Sutton Vawter, which, though termed a hamlet in the act of Incorporation, is frequently called a town in earlier documents, and on some occasions even takes precedence of Sutton Prior; and it is a significant fact that from the time of the opposition raised by the Johns de Valletort of Clyst and Moditon in 1318 to the creation of the borough as a free community, we have no evidence of any further opposition on behalf of the owners of Sutton Vawter. All the difficulty is with the Priory of Plympton and in respect of Sutton Prior. There thus seems to be good reason for believing that the older town had acquired and maintained its claim to corporate rights, and that the line which the Plymouth Reformers of this day took was that of extension and comprehension. Thus it is that in 1411—stimulated by the destruction of 600 houses in a French invasion in 1403—we find the inhabitants of Sutton Prior and Sutton Vawter jointly petitioning for incorporation—the right to elect a mayor, and to levy dues and tolls for defence; the answer being, "Let the petitioners compound with the lords having franchises before the next Parliament, and report having made an agreement." The present incorporation of the town within its existing boundaries was, as already stated, effected in 1439 by Act of Parliament, which seems to have been needful to carry out legally the arrangements made with the Prior of Plympton. No other rights of government were recognized by this statute as existing in the town; but there were saved out of the provisions of the Act the rights of Sir John Cornewaill, Lord of Faunhope, to the Duchy property held under lease by him, and out of the provisions of a subsequent charter his rights as specified within the borough, and those of Thomas Courtenay, Earl of Devon. No one seems to have succeeded, unless the Courtenays, to the claims set up by the Valletorts; and the Priory had suffered so severely by the French inroad that it was probably well disposed to surrender on terms.

The prayer of the Act is in what I cannot but regard as

somewhat significant words, that the town of Sutton Prior, the tithing of Sutton Raf, parcel of the Hamlet of Sutton Vautort (commonly called Plymouth), with a parcel of the tithing of Compton, should be a free borough incorporate with *one* Mayor and *one* perpetual Commonalty. The Act made no provision for the election of any officer besides the mayor, and the creation of fresh burgesses; and its chief provisions, beyond the general powers given by incorporation, were for the acquisition of the manorial rights of the Priory (saving only the advowson of St. Andrew and three messuages which was never to be parcel of the borough), by the Mayor and Commonalty, under terms to be arranged; and for the satisfaction of the Abbot of Buckland for the loss of his Hundred jurisdiction.

On the 25th of July following, however (1440), Henry VI. followed up the Act by a Charter, which gave power to elect a Recorder and a Coroner, made the Mayor and Recorder justices of the peace, conferred the right to hold pleas and to exercise criminal jurisdiction, and to have and hold a Merchants' Guild, "with all and singular the appurtenances to a Merchants' Guild, as the Mayor and Bailiffs of our city of Oxford jointly and severally better and more freely have and hold, or may have and hold." Moreover there was a fresh market grant—a market on Monday and Thursday, and two fairs of three days annually, at the feast of St. Matthew the Apostle, and the feast of the Conversion of St. Paul—the latter, be it noted, the time of year assigned to Passour's "usurpation," and a curious coincidence, if nothing more.

I would call particular attention to the passage referring to a Guild Merchant, for this reason, that either here or in the continuance of a pre-existing custom does it seem most probable we must look for the origin of the form the Corporation assumed. The Charter mentions only the Mayor, Recorder, Coroner, and Commonalty; but within half a century we find mention of the "twelve and twenty-four"—the aldermen or masters and common councilmen—who formed the sole executive down to the year 1803, when the Commonalty successfully asserted their right to choose the Mayor. It was not indeed until the charter of Elizabeth, in 1600, that the "twelve and twenty-four" had the recognition of authority; and my own impression is that they were a modified survival of a pre-existing administrative body. The peculiar way in which the mayor was elected until the Commonalty obtained the power, by a jury of 36 chosen by four alfurers or affeerers—two appointed for the

Aldermen, and two for the Commonalty, 18 by each—recalls the method of electing the prepositus, and may also have been a survival.

There remains among the Plymouth muniments a copy of the Act-Charter in the vernacular—or rather of its earlier portion, written certainly not later than the reign of Henry VII., but which differs so remarkably in some points from present translations of the same Act that it has occurred to me as possibly, in part at least, an original draft :

“ Knowe ye that wher as the towne of Sutton pryor and the thythyng of Sutton Raf and parcellys of the hamelet of Sutton vautor whech towne tethyng and pcellys Comynly be callyd and namyd Plymouth and a sertayne of the tethyng of Compton wythyn the Cowtye of deuynshere beyng and sett so ny to the stronds and costys of the see and soo many and soo greate and soo Comyn applying of fletys of Shyppys and of vessels aswel of Enymys as of others yn the port of the same towne tethyng pcellys of the hamelet and tethyng of Compton lying that fro time to time hyt hath be that the towne tethyng and pcellys aforsaid a fore thys tyme of x tymys yn gretter ptye of the same for the faute of Co—— and aswell the same yn tymes of oure nobyll executors often broke and distreuyth and aswell the ynhabitans of the same of theyre goods and catellys nyghtly and dayly Spoylyd and many of theym of the ynhabitans by the same enymys take and lede to the owte contries and there kepte yn to the tyme that they had made fennans and Ravnson and they were yn harde kepyng p'sament and vnderful kept yn gevys stocks and other wayes and other evyll losts and vnpyfytabyly not lytyll to the same towne Tethyng and pcellys of the hamelett and of the Tethyng of Compton and to the ynhabytance of the same yn tymys past eu' and were hade and many ither yn tymes to Time they doth but yf relef fortifyng and betteryng of the towne tethyng and pcell aforsaid the other remedy be vyded be howfull by the apetycyon to us yn our plement beyng at Westmyster the xijth daye of Noueber last past holden ” and then it is enacted “ for the Rest of the malys of oure enymys theryn dayes applying and for the saluacion of the Towne tethyng and pcellys aforsayd and that the ynhabytance of the same the Rather that the townetethyng and pcellys aforsaid be fro hensforthward a fre Borough In corporat of one Mayer and of one Comynaltie for eu' and hytt shalbe callyd the borowgh of plymouth . . . and that the aforsaid borowgh By the makys and boundys vnder wretyn all tymes that ys to Wete bytwyne the hyll callyd the Wynderygge by the Banke of Sowre pole a yentst the North on the grete dyke otherwyse callyd the greate deche and fro thens ayenst the North vnto Stoke dam'le flete and fro thens by the stronde of the same flete vnto mylbroke brygge ynclewdyd and fro thens to the yate of thorne hylle pke

ayenst motley pkelane and fro thens vnto lypstone brygge
ynclwdyd and fro thens by the seestronde to the lary poynt To
the Catte to henstone fyse store and Est kyng and fro thens to the
said hylle callyd Wynderygge as the mkys and bonds eu' were that
be derectyd and fyxed fully and opynly schewyth.

The metes and bounds as given here differ so materially in some points of expression, though the general effect is the same, from the language of the Act of Parliament, that I give the latter passage as copied by myself from the original roll: "Inter montem vocat Wynrigg p ripam de Sourpole vsus boriā usque ad le grete dyche alias dict' le grate dicke et exinde itum vsus boriā ad Stokedamarleflete et abinde p litus eiusdem flete usque ad Millebroke brigge inclusive et deinde vsus orientam p le middeldicke de Houndescom usque ad Houndescombrigge inclusive et abinde usque ad Thornhilpark exclusive et deinde usque ad Lypstonbrigge inclusive et abinde p litus maris continue usque ad le lare, ad le Catte de Hyingston Fysshtore et Estkyng, et abinde usque dict' montem de Wynrigg." We must see, I think, here that the vernacular version has an independent authority of some kind.

It is difficult to understand the use of the term "parcel of the hamlet of Sutton Vawter"—for the whole of that manor seems included—unless there is some reference here to the sore decay of the older town noted by Leland. It may be however that both in this case and in that of the tithing of Compton, no portion of which as at present recognized forms part of the municipal borough of Plymouth, the omission and inclusion may have been of the very slightest, and soon forgotten, for the purpose of the rectification of the boundary, which followed the natural lines of coasts and watercourses wherever practicable; and only at two places crossed from one such point to the other. One of these was on the verge of Sutton Vawter, next Stonehouse, the other next Compton. Moreover as Leland places Sutton Vawter on the north, giving Sutton Prior the "middle and heart" and Sutton Ralf the east; and as he states that the oldest part of Plymouth in his day was north and west, and some thereof sore decayed, it is probable that Sutton Vawter extended much further up the hill and along the ridge between Surpool and Stoke Damarel Fleet [Stonehouse Mill Lake] than implied in the later use of the word "Old Town." We have also recorded the existence of a spot called "The Vawters" on this ridge, closely adjoining Stonehouse, which aids a similar inference.

A copy of a curious agreement made on the 28th August, 1440, between William Keterigge, Mayor of Plymouth and the Commonalty of the same, and the Prior and Convent of St. Germans, sets forth that Richard Trenode, merchant of Bristol, and Thomasia Venour, widow of William Venour, formerly of Plymouth, and sister of the said Richard Trenode, had been at great expense and labour to have Plymouth made a corporation of "one Mayor and Commonalty." In recognition of this the Mayor and Commonalty, to keep the same Richard and Thomasine in perpetual remembrance as their principal and special benefactors, bound themselves to the Prior and Convent, to maintain a chaplain to say mass daily at the altar of the Blessed Virgin in the Church of St. Andrew, for the souls of Richard Trenode, Alice his late and Joan his present wife, William Venour and Thomasine his widow, for their children, for Richard Trenode and Donisia his wife, father and mother of Richard Trenode, for John Venour and Joan his wife, parents of William Venour; and for the souls of all others, for which Richard Trenode, William and Thomasine Venour were bound to pray.

As another means of remembrance—equally, as the result has proved, *unperpetual*—one of the wards of the borough received the name of Venar Ward; and this was in that part of Sutton Prior which lay immediately west of Sutton Pool, in which locality some of the family at least had lived. We are not in any way told what Trenode and his sister did; but as expense was involved as well as trouble, probably the passage of the Act, after a fashion well understood in those days, was smoothed. The Venours were unquestionably people of standing; for one was mayor in 1377—John, probably the father of William—and their efforts need not have been confined to the finally successful effort.

The following names of mayors and headmen prior to the full incorporation have been preserved: 1310, Richard the Tanner, prepositus of Sutton; 1313, William Berd, prepositus; 1318, Richard Tannere, prepositus; 1325, Edward of Northcote, prior's prepositus; 1370, Maurice Berd, mayor; 1377, John Venour, mayor of Sutton Priors; 1381, William Honyton, mayor; 1383, Humphry Passour, mayor of Sutton Priors; 1384, John Sampson, prepositus; 1395, Walter Crocker, mayor of Sutton Priors; 1397, Richard Row, mayor; 1398, Walter Dymnick or Dymcock, prepositus; 1397, Henry Boon, mayor of Plymouth; 1399-1403 (?), William Pollard, mayor; 1408, William Bentle, mayor; 1412, William Rogherne, mayor of Plymouth; 1413, William

Bentley, mayor of Sutton; 1414, William Boon, mayor of Plymouth; 1418, William Bentley, mayor of Sutton Priors; 1439, William Totwell (the old form of spelling the modern Tothill), prior's portreeve of Sutton.

Though we have here only twenty mayoralties for a period of over a century and a quarter, it is probable from the repetitions preserved that several of these mayors and prepositors held office still more frequently, the range of choice being narrow. Moreover, the fact that between each of Bentley's three recorded mayoralties five years elapsed, seems to point to the existence of a select body—as of aldermen—from whom the choice was made in turn, and is fair collateral evidence of the existence of organized corporate authority.

The good standing of some of these early mayors is shown also by one of them having been chosen to represent the borough in Parliament—William Berd, in 1313; while John de Honeton, no doubt father or grandfather of William Honyton, was elected, probably for Sutton, in 1311. From other sources we learn that several others were also men of wealth for those days.

THE FAUNA OF DEVON.

HEMIPTERA HETEROPTERA ; OR, PLANT BUGS.

BY EDWARD PARFITT.

(Read at Newton Abbot, July, 1884.)

THE present group of insects is in reality a section of that I had the pleasure of bringing before you in 1882. And it, like its predecessor, dates very far back in time. It has a very old and large genealogical tree, whose branches and twigs diverge and ramify until they cover the entire earth, the fresh waters, and a small portion of the sea.

In the latter respect, a small section of this group stands almost alone. Strictly speaking, insects proper are rarely found inhabiting the sea, but the little *Halobates*, a very curious little section of Boatflies, so named from their swimming on their backs, and propelling themselves along with their oar-like legs, do so. Specimens of the marine forms have been met with at least 400 miles from the nearest land, but they are seen only when the sea is quite calm. It is somewhat strange that the sea which covers so large a portion of the globe should not be the home of more insect life than it is; and more especially as numbers of insects in the larva, and in the imago states, live in the brackish waters, or where the fresh and the salt waters mingle together in ditches near the sea. From the testimony of the rocks, and the absence of fossil insects in the marine sediments, this rule appears always to have prevailed, for wherever we find fossil insects it is almost certain, from other animals found with them, that it was either fresh or brackish water in which the sediments were deposited. The aquatic species of this group are mostly predaceous, or prey upon others weaker than themselves; but the majority of the entire section are, more properly speaking, plant feeders, living

on the juices or life-blood of the plants they attack; and when they do attack them in large numbers, prove very injurious to the plants.

The earliest Hemipteron, so far as is at present known, was found in the coal-measures, the place indeed where we should expect to find it; that is, if the habits of the early forms at all corresponded to those of the present day, as the terrestrial species, or what are generally known as plant bugs, are great lovers of warmth, the majority of them living in hot countries, where they revel on the juices of the abundant vegetation, which corresponds in a certain degree with that of the warm swamps of the coal-measure period; those species inhabiting temperate climes, such as our own, are rarely developed until the season is pretty far advanced, or six months have been run off the reel of time.

Great interest is attached to a fossil insect belonging to this group, described by Dr. Dorn. It is a very good example in illustration of the theory of evolution. "It is," he says, "possessed of characters intermediate between those of the Hemiptera and Neuroptera, and was apparently related genetically to the two orders." As we ascend in time the geological scale, the insects of this order, as is the case with most other orders, increase in numbers and variety; but in no way does the geological record represent the numbers of species of Hemiptera which swarm in tropical regions of the present day.

Some few of the species of Hemiptera inhabiting this country have been accused of destroying, or if not entirely destroying, greatly injuring some of our most valuable crops. The potato blight, for instance, was a few years ago supposed to have been caused by the attacks of one or two species. *Calocaris bipunctatus* was considered to be the worst. This common species was found in considerable numbers on the plants, but we know now that these insects have nothing really to do with the potato parasite. It is true that when the insects attack the plants in great numbers, living as they do on the vital juices or blood, they must naturally weaken them, and by this means render the plants more liable to the attacks of the fungus. I have frequently observed, in dry, hot seasons, that where these insects are numerous, and have attacked the young shoots of plants, these shoots wither and die. They have been what is commonly called in Devon "stung."

There are two species in particular that have been accused of causing great injury to our corn crops, both wheat and

barley; these are *Leptopterna dolabratus* and *ferruginea*; but I am much inclined to believe myself that they are more the farmer's friend than his enemy, as I think these species feed on the aphides found on grasses and on the corn; but I am obliged to admit that the habits of many of our native insects are still to be discovered, and the two above named amongst them. There is therefore a wide and interesting field open here to the investigations of naturalists.

In 1858 I met with a number of pupæ cases of some insects I did not then know. They were tough, of a coriaceous substance, elliptical, and attached by their long axis to the root of *Sparganium ramosum*, a common water plant. I cut two of the cases open, and in one smaller than the other a larva was enclosed, probably of some beetle; and the other contained nearly a full-grown *Notonecta glauca*. The discovery of this is a good deal at variance with that recorded by Professor Westwood, in which he follows Frisch, tom. vi. tab. 13, and De Geer and Rösel. Their statement is this: "The larvæ and pupæ differ only from the imago in their smaller size, and in wanting wings; in the pupæ the rudiments of these organs are enclosed in the small flat tubercles on the back; they have the same habit as the imago." The authors above quoted have illustrated the preparatory states of these insects. According to the last-named author, "the eggs, which are attached to the stems and leaves of aquatic plants, and are of an oval form, are hatched in fifteen days; the young make their appearance at the beginning of the spring, and the parent survives until they have arrived at maturity." That is to say, the parent lives through the winter and far into the spring and summer.

An illustration of the affection shown by at least one species of these insects for their young, I had the good fortune of observing some years ago. De Geer had observed the remarkable care exhibited by the same species as fell under my own notice, just one hundred years before, but his observation had not up to that time been verified. Since I saw the remarkable felicity exhibited by this lowly creature, the same thing has fallen under the observation of the Rev. J. Hellins. The species under consideration is named *Acanthosoma griseum*. When I first saw the mother, sitting on the leaf of a birch tree in the wood at Fordlands, near Ide, in the bright sunshine in the midst of her progeny, I was much struck by the happy appearance of the family; it reminded me at once of the affection I had seen evinced by female Forficulæ, or earwigs, for their young. The mother would

occasionally get up and look around her, apparently to see if any enemy were approaching, and if all was quiet she would sit down again. When disturbed by anything, for instance by a bit of stick, with which I touched a young one, the mother directly came to its rescue, putting her antennæ down to the little thing, and drawing them over it. If that would not do she would walk round it, apparently caressing it, and endeavouring in that way to protect it. I repeated the experiment with some of the other young ones, to see if it really was affection I had witnessed, and she repeated very nearly the same conduct, now and then varying it by placing a leg over the little one. She would when the disturbance was continued get greatly excited, and run round the leaf and her young ones, and appear exceedingly anxious about her little charges; in fact, I never saw such affection exhibited by any insect. And, I must add, that I certainly felt a pang at taking the lives of this happy family; but had I not done so, this observation may not have been recorded.

There is one species of this order of insects concerning which very few people, I presume, at one time or another have not made its acquaintance; I mean that common pest, the bug—*Acanthia lectularia*. This insect is said to have been introduced from America; and in a *Treatise on Bugs*, by John Southall, published in 1730, he says they have been known in England about sixty years. This must, however, be a mistake, as Mouffett mentions its having been seen in 1503; and it was well known to Pliny, Aristotle, Aristophanes, and Dioscorides; so that, although we may have received it from America, it must have been familiar to the people of Thrace at least 300 years before the Christian era, and to Pliny at Rome in the first century.

Southall made several experiments with this insect, to try and discover its means of subsistence when not attacking the human subject. He fed them on the sap of deal, said to be one of their favourite foods; they will also thrive on blood, dry paste, size, beech, osier, and some other woods, the sap of which they suck up. Oak, walnut, cedar, and mahogany they will not feed on.

That the insect is imported from America at the present day there can be little doubt, as a case of swarming of this pest in a newly-built and never-been-inhabited cottage has lately come under my observation, in the construction of which the builder had used American deals.

The original English name for the bug was "Chinche," or

wall louse; and the term bug, which is a Celtic word, signifying a ghost or goblin, was applied to them after Ray's time, most probably because they were considered "terrors by night," hence the English word "bugbear." The word "Chinche," Latham says, is now almost confined to America, but is of English origin, and its meaning in its English dress, was "blood-sucker" or miser.

The disgusting odour given off by the majority of the species is believed to be to these insects a means of defence, as no birds or any other creature, so far as I am aware, will touch them, so that they live quite in immutable bliss, fearing no enemies. Few persons but have experienced a disagreeable taste and smell when eating raspberries and strawberries, but especially the former; this is the trail where one of the plant bugs has passed over it.

I feel somewhat reluctant to close this section of the Hemipteræ, as I am almost certain that when the more remote parts of the county have been worked, many more species will be added to this group; at the same time, I know of only one other collector in the county, and he has done nothing for several years. This contribution to this family must be regarded as the foundation only of a much more complete structure to be raised upon it by some more fortunate and competent naturalist. We have in the British Isles, so far as has been ascertained, 428 species, and of this number I have enumerated 160 as indigenous to Devonshire. Specimens of all of them are in my own cabinet, collected by myself.

In conclusion, I beg to thank Mr. J. W. Douglas and Mr. Edward Saunders for their kindness in rendering me assistance in the elucidation of some of the obscure and most difficult species, as it is almost impossible to convey in words some of the more subtle peculiarities which distinguish species. We have therefore to submit them for comparison with authentic specimens.

CATALOGUE.

WITH NOTES AND OBSERVATIONS.

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Order, HEMIPTERA, *Linnaeus*.
 Sub-Order, HEMIPTERA-HETEROPTERA, *Latrielle*.
 Division, GYMNOCERATA.
 Family, SCUTELLERIDÆ.
 GENUS, *CORIMELENA*, *White*.

SCARABÆOIDES, *Linn*.

Doug. and Scott, p. 58.

This interesting little species appears to be rare with us, as only one specimen has fallen to my lot. This was captured in the Cathedral Close, Exeter, in May, 1871.

GENUS, *PODOPS*, *Laporte*.

INUNCTUS, *Fab*.

Doug. and Scott, p. 73.

This is also a rare species. I have met with one only.

Family, CYDNIDÆ.
 GENUS, *SEHIRUS*, *Amyot et Serville*.

BICOLOR, *Linn*.

Don. Brit. Insects, vol. ix. pl. 297; *Doug. and Scott*, p. 52.

In woods and hedges under leaves, &c.; not common.

BIGUTTATUS, *Linn*.

Doug. and Scott, p. 54.

In woods at Dunsford, Stoke, under dead leaves, and a favourite habitat under the large masses of the dog lichen (*Peltidea canina*) in February and March; but not common.

MORIO, Linn.*Doug. and Scott, p. 55.*

Also captured under the dog lichen in Stoke Wood, near Exeter.

ALBOMARGINATUS, Fab.*Doug. and Scott, p. 56.*

Under leaves in hedges at Exmouth, Haldon, Sidmouth, &c.; frequent in summer.

*Family, PENTATOMIDÆ.***GENUS, ZICRONA, Amyot et Serville.****CÆRULEA, Linn.***Doug. and Scott, p. 88.*

Apparently very scarce with us. I have seen one only, which is in my collection.

GENUS, RHACOGNATHUS, Fieber.**PUNCTATUS, Linn.***Doug. and Scott, p. 92.*

Beaten from alders in the Exeter district in September; not common.

GENUS, STRACHIA, Hahn.**OLERACEA, Linn.***Doug. and Scott, p. 86.*

This is a scarce insect in Devon; at least, so far as my experience goes. I captured one in the Cathedral Close, Exeter, in August.

GENUS, PENTATOMA, Oliver.**BACCARUM, Linn.***Doug. and Scott, p. 78 (nigricorne).*

Three specimens are recorded as captured in Devon—two by my old friend, Mr. J. J. Reading, and one by Mr. J. H. Brewer.

VERBASCI, De Geer.*Doug. and Scott, p. 80 (baccarum).*

This is of frequent occurrence on brambles, &c., in autumn, and generally distributed.

VIRIDISSIMUM, Poda.*Doug. and Scott, p. 83 (dissimile); Don. British Insects, vol. iv. pl. 123.*

Common everywhere on raspberries, to which it gives a most disagreeable odour and taste.

Family, ACANTHOSOMIDÆ.
GENUS, PIEZODORUS, Fieber.

LITURATUS, Fab.

Doug. and Scott, p. 100 (purpureipennis).

Common on broom bushes at Dunsford, Newton, and generally where this plant grows, in autumn.

GENUS, ACANTHOSOMA, Curtis.

GRISEUM, Linn.

Doug. and Scott, p. 101.

This is an exceedingly interesting species, and not uncommon on birch and alders; generally distributed. This insect exercises great care over its young, which was first noticed by De Geer, and again by myself, just a hundred years after. See introduction to this Catalogue.

HÆMORRHOIDALE, Linn.

Don. British Insects, vol. vii. pl. 218, f. 2; *Doug. and Scott*, p. 107.

One of the largest insects belonging to this group, and very generally distributed and common.

GENUS, TROPICOBIS, Hahn.

RUFIPES, Linn.

Doug. and Scott, p. 98.

One of the most abundant; on bushes and trees, and generally distributed.

Family, COREIDÆ.

GENUS, VERLUSIA, Spinola.

RHOMBEA, Linn.

Doug. and Scott, p. 116.

A rather scarce species; taken by the Rev. R. Douglas at Manaton, and in the Exeter district by myself.

GENUS, SYROMASTES, Latrille.

MARGINATUS, Lin.

Doug. and Scott, p. 110; *Don. Brit. Ins.* vol. xi. 375.

A widely-distributed and common species, found mostly under leaves, under hedges, and near woods in autumn.

GENUS, PSEUDOPHLEBUS, Burmeister.

FALLENII, Schill.

Doug. and Scott, p. 124.

Apparently a very rare species. A specimen was captured by the late Mr. Curtis on Braunton Burrows, North Devon, in September.

GENUS, **DASYCORIS**, *Dallas.*(Coreus, *Douglas and Scott.*)**HIRTICORNIS**, *Fab.**Doug. and Scott*, p. 119.

Captured by sweeping on Haldon in August. Very rare.

GENUS, **THERAPHA**, *Amyot et Serville.***HYOSCYAMI**, *Linn.**Doug. and Scott*, p. 129.

This beautiful insect, although named after the plant called henbane, *Hyoscamus niger*, is not specially attached to it, as I have taken specimens on other plants, and also where the henbane does not grow. Captured at Teignmouth, Dawlish, Braunton Burrows; always near the sea; in September.

GENUS, **CORIZUS**, *Fallen.***CAPITATUS**, *Fab.**Doug. and Scott*, p. 133.

Very rare; one specimen only by sweeping in the Exeter district.

GENUS, **ALYDUS**, *Fabricius.***CALCARATUS**, *Linn.**Doug. and Scott*, p. 143.

Apparently a scarce species. I took one on Bolt Head in August.

GENUS, **STENOCEPHALUS**, *Latrielle.***AGILIS**, *Scop.**Doug. and Scott*, p. 141.

Captured by sweeping amongst euphorbias on the sand hills, Exmouth Warren, and Braunton Burrows, in September.

NEGLECTUS, *H. Schff.**Doug. and Scott*, p. 142.

This species is recorded by the above authors as taken on the coast of Devon.

Family, **BERYTIDÆ.**GENUS, **METACANTHUS**, *Costa.***PUNCTIPES**, *Germ.**Doug. and Scott*, p. 146.

I captured several specimens of this on *Ononis* on Langstone Point, near Dawlish, in August.

MINOR, *H. Schff.*

GENUS, **BERYTUS**, *Fabricius*.

Doug. and Scott, p. 157 (contaminatus).

Captured by Mr. H. T. Stainton in North Devon.

MONTIVAGUS, *Meyer*.

Doug. and Scott, p. 151.

Captured by Mr. H. T. Stainton, on the coast of North Devon, in October.

GENUS, **NEIDES**, *Latrielle*.

TIPULARIS, *Linn.*

Doug. and Scott, p. 162.

I captured this rare insect by sweeping on Haldon in August, 1869; one specimen only.

Family, PYRRHOCORIDÆ.

GENUS, **PYRRHOCORIS**, *Fallen*.

APTERUS, *Linn.*

Doug. and Scott, p. 164.

Taken at Torquay, Teignmouth, and on the Oarstone, at the entrance to Torbay, in abundance, in 1865.

Family, LYGÆIDÆ.

GENUS, **GASTRODES**, *Westwood*.

FERRUGINEUS, *Linn.*

Doug. and Scott, p. 168.

Captured on Langstone Cliffs, near Dawlish, in August; apparently scarce.

GENUS, **NYSIUS**, *Dallas*.

THYMI, *Wolff*.

Doug. and Scott, p. 226.

Taken by sweeping heath on Haldon, but scarce.

GENUS, **EREMOCORIS**, *Fieber*.

PODAGRICUS, *Fab.*

Doug. and Scott, p. 177 (erraticus).

Captured by sweeping on Dartmoor, near Okehampton, in July.

GENUS, **SCOLOPOSTETHUS**, *Fieber*.

ADJUNCTUS, *D. and S.*

Doug. and Scott, p. 188.

Common in May by sweeping grass and rough herbage on Haldon, and Whitstone; generally distributed.

AFFINIS, Schill.*Doug. and Scott, p. 185.*

Taken under leaves, and by sweeping in similar localities to the above ; at the same time rather scarce.

CONTRACTUS, H. Schff.*Doug. and Scott, p. 186.*

Captured at Exminster by sweeping, in June ; frequent.

GENUS, **CALYPTONOTUS**, *Douglas and Scott.*

ROLANDRI, Linn.*Doug. and Scott, p. 172.*

Two specimens of this beautiful insect I have taken—one at Newton, in February, the other in the Exeter Cathedral Close, in May.

PEDESTRIS, Panz.*Doug. and Scott, p. 174.*

The only specimen I have met with was taken in Stoke Wood under dead leaves.

GENUS, **TRAPEZONOTUS**, *Fieber.*

AGRESTIS, Panz.*Doug. and Scott, p. 192.*

Taken on the sand hills at Exmouth, in short grass, in July ; plentiful.

GENUS, **TROPISTETHUS**, *Fieber.*

HOLOSERICEUS, Hahn.*Doug. and Scott, p. 201.*

This rare insect was taken by Dr. Power at Seaton, at the roots of grass in sandy places, in January.

GENUS, **DEYMUS**, *Fieber.*

SYLVATICUS, Fab.*Doug. and Scott, p. 196.*

Taken by sweeping, near Lympstone, and beaten from bushes ; frequent in July and August.

BRUNNEUS, Sahlb.*Doug. and Scott, p. 198.*

Captured by sweeping, at Exwick, in May and June ; not so common as the last.

PILIPES, Fieb.*Doug. and Scott, p. 199.*

A scarce species with us ; I have only seen one which I captured on Stoke Hill, in August.

GENUS, **RHYPAROCHROMUS**, *Curtis*.**DILATATUS**, *H. Schff.**Doug. and Scott*, p. 204.

Captured by sweeping short herbage between the woods at
Stoke, also at Manaton, in May.

ANTENNATUS, *Schill.**Doug. and Scott*, p. 206.

Taken by the Rev. R. Douglas at Manaton.

GENUS, **PERITRECHUS**, *Fieber*.**LUNIGER**, *Schill.**Doug. and Scott*, p. 188.

Taken by sweeping heath, &c., on Dartmoor, in October ;
very scarce.

NUBILUS, *Fall.**Doug. and Scott*, p. 189.

Captured by sweeping in the Exeter district, but rare.

GENUS, **STYGNOCORIS**, *Douglas and Scott*.**STETHOTROPIS**, *Douglas and Scott*.**RUSTICUS**, *Fall.**Doug. and Scott*, p. 204 (*incana*).

Taken by beaten nettles, on Red Hills, near Whitstone, in
May.

SABULOSUS, *Schill.**Doug. and Scott*, p. 215.

Common on bushes and mixed hedges, also under moss,
&c., in July and August.

ARENARIUS, *Hahn.**Doug. and Scott*, p. 216.

Plentiful under leaves in sandy places, and at the roots of
grass, all through the year.

GENUS, **ISCHNOBRYNCHUS**, *Fieber*.**DIDYMUS**, *Zett.*

Taken by sweeping at Torquay, in April ; very scarce.

GEMINATUS, *Fieb.**Doug. and Scott*, p. 233 (*residæ*).

Taken at Torquay and Woodbury Common, in April and
May ; not common.

Family, TINGIDIDÆ.

GENUS, *MONANTHIA*, *Laport.**CARDUI*, *Linn.**Doug. and Scott*, p. 251.

Not uncommon on thistles, in some seasons, in August and September.

GENUS, *DEREPHYSIA*, *Spinola.**FOLIACEA*, *Fall.**Doug. and Scott*, p. 254.

Very rare ; one taken by sweeping, near Dawlish, in August.

GENUS, *DICTYONOTA*, *Curtis.**CRASSICORNIS*, *Fall.**Doug. and Scott*, p. 255.

Scarce ; taken by sweeping herbage, on the coast.

STRICHNOCERA, *Fieb.**Doug. and Scott*, p. 256.

Taken on Bovey Heathfield, in September ; very scarce.

GENUS, *ACALYPTA*, *Westwood.*GENUS, *ORTHOSTIRA*, *Doug. and Scott.**PARVULA*, *Fall.**Doug. and Scott*, p. 263 (obscura).

The only specimen I have seen I took under dry marine rejectamenta, on Exmouth Warren, in August.

Family, CAPSIDÆ.

GENUS, *MIRIS*, *Fabricius.**CALCARATUS*, *Fall.**Doug. and Scott*, p. 286.

Common everywhere from June to October.

LÆVIGATUS, *Linn.**Doug. and Scott*, p. 284.

Very generally distributed on coarse herbage by wood-sides, in August to October.

HOLSATUS, *Fab.**Doug. and Scott*, p. 283.

Captured on Prestonbury Camp, near Drewsteignton, on ferns ; also on coarse herbage on the borders of Dartmoor in June and July ; not common.

GENUS, **MEGALOCEREA**, *Fieber*.
MIRIS, *pars*, *Doug. and Scott*.

ERRATICA, *Linn.*

Doug. and Scott, p. 287.

On ferns and coarse herbage; generally distributed; in September.

RUFICORNIS, *Fall.*

Doug. and Scott, p. 290.

On coarse herbage by woodsides; common in July to October.

GENUS, **LEPTOPTERNA**, *Fieber*.

DOLOBRATA, *Linn.*

Doug. and Scott, p. 297.

Taken at Torquay, Dartmoor, and Exeter; generally distributed; July to end of autumn.

FERRUGATA, *Fall.*

Doug. and Scott, p. 295.

Beaten off oaks and other trees; generally distributed; in July to end of autumn.

GENUS, **PANTILIUS**, *Curtis*.

TUNICATUS, *Fieb.*

Doug. and Scott, p. 333.

Beaten from alders and hazel, in September; common.

GENUS, **LOPUS**, *Hahn*.

SULCATUS, *Fieb.*

On umbelliferous flowers; rare; in August.

GENUS, **PHYTOCORIS**, *Fallen*.

POPULI, *Linn.*

Beaten off trees and bushes, in July and September; not common.

TILLÆ, *Fab.*

Doug. and Scott, p. 303.

Common on various trees, in August to end of autumn.

VARIPES, *Boh.*

Doug. and Scott, p. 311 (*ulmi*).

Captured, by beating hedges and trees, in July; not an abundant species, but widely distributed.

ULMI, *Linn.*

Doug. and Scott, p. 311 (*divergens*).

A common species, on trees and hedges, from July to October.

GENUS, **MIRIDIUS**, Fieber.

QUADRIVIRGATUS, Costa.

Doug. and Scott, p. 300.

Taken, by sweeping grass in a field, near the sea at Bideford, in August; scarce.

GENUS, **ONCOGNATHUS**, Fieber.

DERÆOCORIS, *pars*, *Doug. and Scott*.

BINOTATUS, Fab.

Doug. and Scott, p. 323.

A common and generally distributed species, found from June to October.

GENUS, **CALOCORIS**, Fieber.

DERÆOCORIS, *Doug. and Scott*.

FULVOMACULATUS, De Geer.

Doug. and Scott, p. 316.

Beaten off ash-trees, in June in the Exeter district, but not common.

STRIATELLUS, Fab.

Doug. and Scott, p. 318.

I captured this pretty species, by sweeping on Haldon, in June; it appears to be local, as I have not met with it anywhere else.

SEXGUTTATUS, Fab.

Doug. and Scott, p. 322.

An abundant insect some seasons on the umbels of *Conium maculatum*, and on the heads of tansy, in June and July.

STRIATUS, Linn.

Doug. and Scott, p. 320.

This handsome species is apparently rare with us; I have met with only a single specimen, which I captured at Dunsford, in June, 1862.

ROSEOMACULATUS, De Geer.

Doug. and Scott, p. 327 (ferrugatus).

Not an uncommon species amongst rough herbage by hedges; generally distributed; from July to October.

INFUSUS, H. Schff.

Doug. and Scott, p. 331.

I met with a few specimens of this handsome insect, by beating oaks, in the Alphington meadows, in September.

CHENOPODII, Fall.*Doug. and Scott, p. 325.*

An abundant insect everywhere, but especially so on *Ononis arvensis*, on Langstone Cliff, near Dawlish, and on Bovey Heathfield; in great numbers in July.

BIPUNCTATUS, Fab.*Doug. and Scott, p. 319; Curtis's Farm Insects, p. 434.*

A common and generally distributed species, found on all kinds of vegetation, from June to October; it seems, however, to prefer the common thistle, *Cnicus arvensis*. This insect has been called the Potato Bug, merely because it was found on that plant.

GENUS, **RHOPALOTOMUS, Fieber.****ATER, Linn.***Doug. and Scott, p. 440.*

Common everywhere, by sweeping grass, in July and August.

GENUS, **CAPSUS, Fabricius.****LANIARIUS, Linn.***Doug. and Scott, p. 442 (capillaris).*

Taken by beating tallows, near Starcross, in August; by no means common.

GENUS, **LIOCORIS, Fabricius.****TRIPUSTULATUS, Fab.***Doug. and Scott, p. 450.*

An abundant insect; some seasons on the flowers of umbelliferæ, and on alders, &c., by the waterside, in August.

GENUS, **PECILOSCYTUS, Fieber.****SYSTRATIOTUS, Douglas and Scott.****CHARAGOCHILUS, Douglas and Scott.****UNIFASCIATUS, Fab.**

This very pretty insect appears to be scarce with us, as only one has fallen to my net; it was beaten from alders, in August.

GENUS, **LYGUS, Hahn.****PABULINUS, Linn.***Doug. and Scott, p. 457.*

Beaten off bushes, in the Exeter district, in August; common.

LUCORUM, Meyer.*Doug. and Scott, p. 458.*

On various plants, but more especially on *Artemisia vulgaris*, the common wormwood, and on brambles, in August.

SPINOLÆ, Meyer.*Doug. and Scott, p. 458.*

Taken on the common thistle (*Cnicus arvensis*) in the Exminster marshes; very scarce; in August.

PRATENSIS, Fab.*Doug. and Scott, p. 464.*

A common species, taken by sweeping hedge-banks; generally distributed.

Var. CAMPESTRIS, Linn.*Doug. and Scott, p. 463.***KALMII, Linn.***Doug. and Scott, p. 452 (Orthops kalmii).*

Common on heaths by sweeping, and on herbage by wood-sides, in July and August.

CERVINUS, H. Schff.

On the common fern, Stoke Wood, near Exeter, September; scarce.

GENUS, **BRYOCORIS, Fallen.****PTERIDIS, Fall.***Doug. and Scott, p. 277.*

On the common fern (*Pteris aquilina*) in Stoke Wood, also on ferns in Messrs. Veitch's nursery, in September; not common.

GENUS, **PITHANUS, Fieber.****MAERKELI, H. Schff.***Doug. and Scott, p. 281.*

Taken on *Anthemis cotula*, Stoke Hill, near Exeter; abundant at one spot; also captured by the side of the Otter, and at Lympstone, in September, but all immature specimens.

GENUS, **GLOBICEPS, Latrille.****FLAVOMACULATUS, Fieb.***Doug. and Scott, p. 364 (selectur).*

Beaten from nut bushes, in May, in the Exeter district, but not common.

GENUS, **CYLLOCOSIS, Hahn.****HISTRIONICUS, Linn.***Doug. and Scott, p. 368.*

This very pretty species is taken, on birch and other trees in woods, from June to September, but not common.

GENUS, *CAMPYLONEURA*, Fieber.*VIRGULA*, H. Schff.

Doug. and Scott, p. 373.

A scarce insect with us; I have taken it at Lustleigh Cleave, and at Exwick, in July.

GENUS, *ÆTORHINUS*, Fieber.*ANGULATUS*, Fall.

Doug. and Scott, p. 347.

Beaten from alders and other trees growing near water; common, and generally distributed, in August.

GENUS, *CHLAMYDATUS*, Curtis.*SPHYROCEPHALUS* and *TYTTHUS*, Doug. and Scott.*AMBULANS*, Fall.

Doug. and Scott, p. 349.

Rather an uncommon insect; taken by sweeping rough herbage, at Exwick and on Dartmoor, in July.

CARICIS, Fall.

Doug. and Scott, p. 352 (elegantulus).

Captured by sweeping in the marshes at Exminster, near the station, in September.

GENUS, *DICYPHUS*, Fieber.*IDOLOCORIS*, Doug. and Scott.*GLOBULIFER*, Fall.

Doug. and Scott, p. 377.

Very scarce; taken by sweeping on Red Hills, near Whitstone, in June.

EPILOBII, Reuter.

Doug. and Scott, p. 380 (pallidus).

Not uncommon on *Epilobium hirsutum*, by the side of ditches in Exminster Marshes, and by Alphington Brook, in August.

GENUS, *HETEROCORDYLUS*, Fieber.*TIBIALIS*, Hahn.

Doug. and Scott, p. 434.

This is frequently met with when sweeping rough herbage in August.

GENUS, *ORTHOCEPHALUS*, Fieber.*SALTATOR*, Hahn.

Doug. and Scott, p. 341.

Under dry weeds and rubbish on the shore near Lympstone in August; very scarce.

GENUS, **LOXOPS**, *Fieber*.**COCCINEUS**, *Westerh.*

Beaten off ash trees in the Exeter district in August; frequent.

GENUS, **ORTHOTYLUS**, *Fieber*.**LITOSOMA**, *Doug. and Scott*.**NASSATUS**, *Fab.*

Doug. and Scott, p. 337.

On various trees, willows, alders, and bushes in low meadows; generally distributed; from June to October.

FLAVOSPARSUS, *Sahlb.*

Doug. and Scott, p. 341 (*prasinus*).

On potatoes, in fields and gardens, in July.

CHLOROPTERUS, *Kirsch.*

Doug. and Scott, p. 339 (*virescens*, male).

Taken near Manaton by Rev. R. Douglas.

ERICETORUM, *Fall.*

Doug. and Scott, p. 343.

Captured by sweeping on Haldon, Bovey Heathfield, and Woodbury Common, in July.

GENUS, **HETEROTOMA**, *Latrielle*.**MERIOPTERA**, *Scop.*

Doug. and Scott, p. 438; *Don*. vol. iv. pl. 135.

A very generally-distributed species, on nettles and rank herbage, from July to October.

GENUS, **HOPLOMACHUS**, *Fieber*.**THUNBERGI**, *Germ.*

Doug. and Scott, p. 396.

Taken on Langstone Point, Dawlish, by sweeping among *Anthyllus vulneria* and *Ononis spinosa*, in July.

GENUS, **MACROCOLEUS**, *Fieber*.**TANACETI**, *Fall.*

Captured on the common tansy (*Tanacetum vulgare*) in a lane leading from Wonford to Sandygate, in the Exeter district, in September; but not common.

GENUS, **HARPOCERA**, *Curtis*.**THORACEA**, *Fall.*

Doug. and Scott, p. 469.

Taken on Haldon by sweeping heath, and also beaten from hazel, from May to October; rare with us.

GENUS, *PHYLUS*, *Hahn*.*MELANOCEPHALUS*, *Linn*.*Doug. and Scott*, p. 355.

This, so far as my experience goes, is a scarce species in Devon. I have met with two only—one at Turf, near Powderham, and the other at Drewsteignton, in June.

CORYLL, *Linn*.*Doug. and Scott*, p. 356.

Beaten off hazel bushes, in July; a widely-distributed species.

AVELLANÆ, *H. Schff*.*Doug. and Scott*, p. 357.

Plentiful on ash and other trees, at the bottom of Stoke Wood, in June to September.

GENUS, *PSALLUS*, *Feiber*.*BETULETI*, *Fall*.*Doug. and Scott*, p. 404 (ambiguus).

Beaten from bushes, in the lane leading from Wonford to Sandygate, in July; not common.

AMBIGUUS, *Fall*.*Doug. and Scott*, p. 406 (obscurus).

Very abundant on trees and hedges everywhere from July to October.

VARIABILIS, *Fall*.*Doug. and Scott*, p. 408 (Whitei).

On oaks and other trees; common, and generally distributed; in July.

SIMILLIMUS, *Kirsch*.*Doug. and Scott*, p. 410.

Beaten off ash-trees, in the Exeter district, in June; rare.

SALICELLUS, *Meyer*.*Doug. and Scott*, p. 411.

On hazel and willow bushes, in the Exeter district; apparently rare.

ROSEUS, *Fall*.*Doug. and Scott*, p. 417 (Salices).

Beaten from alders, by Ide Brook, in September; very scarce.

VARIANS, H. Schff.*Doug. and Scott, p. 418 (distinctus).*

On brambles; common; June to September.

Var. DISTINCTUS.*Doug. and Scott, p. 419.*

On oaks and beech, in Stoke Wood, in August; not very common.

GENUS, FLAGIONATHUS, Fieber.**ALBIPENNIS, Fall.**Taken on a plant known in gardens as southernwood (*Artemisia arborea*), in a garden at Ide, near Exeter, in August, 1867; very scarce.**VIRIDULUS, Fall.***Doug. and Scott, p. 401.*

A common species, on rough herbage by wood sides; generally distributed; from June to October.

ARBUSTORUM, Fab.*Doug. and Scott, p. 402.*An abundant insect, on the flowers of umbelliferæ, but more especially attached to the heads of flowers of *Spiræa ulmaria* (meadow sweet), in August to the end of autumn.**Family, ANTHOCORIDÆ.
GENUS, ANTHOCORIS, Fallen.****NEMORUM, Linn.***Doug. and Scott, p. 495.*

An abundant species on all kinds of trees and herbage throughout the summer, and in winter under leaves and dead bark of trees.

NEMORALIS, Fab.*Doug. and Scott, p. 496.*

Equally abundant to the former, and found in similar places and times.

GENUS, PIEZOSTETHUS, Fieber.**CURSITANS, Fall.***Doug. and Scott, p. 501 (rufipennis).*

Under bark and dead leaves, in March; apparently rare; Stoke Wood, Exeter.

GENUS, **TRIPHEPS**, *Fieber*.**MINUTA**, *Linn.**Doug. and Scott*, p. 504.

Taken under dry seaweeds on the shore, near Lympstone;
also by sweeping on the railway-bank near the sea,
on the South Devon line, in August.

NIGRA, *Wolff*.*Var.* **OBSCURUS**.*Doug. and Scott*, p. 503.

Common on flowers by woodsides; generally distributed;
from June to October.

GENUS, **LYCTOCORIS**, *Hahn*.**CAMPESTRIS**, *Fab.**Doug. and Scott*, p. 449 (domesticus).

Captured feeding on the larvæ of a species of thrips, and
on flowers, in July; it punctures the larva and sucks
out its juices, from which the larva consequently dies.

Family, **ACANTHIDÆ**GENUS, **ACANTHA**, *Fabricius*.**LECTULARIA**, *Linn.**Doug. and Scott*, p. 510.

Too common in houses everywhere; the greatest pest to
the human race.

Family, **REDUVIDÆ**.GENUS, **FLOIARIA**, *Scopoli*.**VAGABUNDA**, *Linn.**Doug. and Scott*, p. 536.

A rare insect with us; I have only seen one specimen.
Beaten from an ivy-covered tree in Killerton Park, by
the Rev. J. Hellins, in July.

GENUS, **NABIS**, *Latrielle*.**LATIVENTRIS**, *Boh.**Doug. and Scott*, p. 550 (apterus).

Common among rough herbage in autumn everywhere.

MAJOR, *Costa*.*Doug. and Scott*, p. 554 (flavomarginatus).

Common on trees and bushes, from July to October.

FERUS, Linn.*Doug. and Scott, p. 555.*

Taken by sweeping in a meadow, near Polsloe Farm, in August; apparently scarce.

RUGOSUS, Linn.*Doug. and Scott, p. 552 (dorsalis).*

Common among rough herbage everywhere, in August and September.

Family, SALDIDÆ.
GENUS, SALDA, Fabricius.

LATERALIS, Fall.*Doug. and Scott, p. 520 (pulchella).*

Taken on the shore near the ferry, Topsham; not common; in September.

OETHOCHILA, Fieb.*Doug. and Scott, p. 521.*

Taken under stones on Exmouth Warren, in wet or damp places, reached by high tides, in August and October; not common.

SALTATORIA, Linn.*Doug. and Scott, p. 522 (fucicola).*

Under stones, resting on mud on the shore, towards the mouth of the Exe, in June; rare.

Family, HYDROMETRIDÆ.
GENUS, HYDROMETRA, Fabricius.

STAGNORUM, De Geer.*Doug. and Scott, p. 576 (Limnobates stagnorum); Don. vol. ii. pl. 38.*

Common among floating weeds, on ponds and ditches, everywhere in summer, in brackish water as well as fresh.

Family, GERRIDÆ.
GENUS, GERRIS, Fabricius.

NAJAS, De Geer.*Doug. and Scott, p. 560.*

Captured in the salt-water ditches at Seaton and Topsham.

THORACICA, Schaum.*Doug. and Scott, p. 562.*

Common and generally distributed in our streams.

GIBBIFERA, *Schaum.**Doug. and Scott, p. 564.*

Taken in the stream at Tavy Cleave, on the higher part of Dartmoor, June; rare in this locality.

LACUSTRIS, *Linn.**Doug. and Scott, p. 566; Don. vol. iv. pl. 118.*

On all our streams, ponds, and ditches, both brackish and fresh-water; common.

Family, VELIIDÆ.

GENUS, VELIA, *Fabricius.*CURRENS, *Fab.**Doug. and Scott, p. 571.*

Common everywhere, in stagnant and slowly-running streams, from spring to autumn; on the higher as well as the lower streams on Dartmoor.

Family, NEPIDÆ.

GENUS, RANATRA, *Linnaeus.*LINEARIS, *Linn.**Doug. and Scott, p. 582; Don. vol. iii. pl. 105.*

A rather rare insect with us, perhaps because it is so difficult to obtain, living as it does at the bottom of deep ponds amongst decaying vegetation.

GENUS, NEPA, *Linnaeus.*CINEREA, *Linn.**Doug. and Scott, p. 584; Don. vol. i. pl. 18.*

A generally-distributed insect, met with at the bottom of ponds and ditches, all the summer.

CRYPTOCERATA.

Family, NAUCORIDÆ.

GENUS, NAUCORIS, *Geoffroy.*CIMICOIDES, *Linn.**Doug. and Scott, p. 580; Don. Brit. Insects, vol. ii. pl. 381.*

Common in ditches among water-plants. This insect needs to be carefully handled, as it is very apt, in self-defence, to inflict a wound by puncturing with its rostrum, into which it instils an acrid poison, which causes the wound to become inflamed, and great pain to ensue.

Family, NOTONECTIDÆ.
GENUS, NOTONECTA, Linnaeus.

GLAUCA, *Fab.*

Doug. and Scott, p. 587; *Don.* vol. iii p. 75.

In brackish-water ditches, at Seaton and Topsham; common in September.

Var. MACULATA.

Doug. and Scott, p. 588.

In brackish-water ditches, at Seaton and Topsham; Plymouth (Dr. Leach), in September.

GENUS, PLEA, *Fabricius.*MINUTISSIMA, *Fab.*

Doug. and Scott, p. 591.

Common in ponds and ditches, amongst the thick vegetation, all through the summer.

Family, CORIXIDÆ.
GENUS, CORIXA, *Geoffroy.*

GEOFFROYI, *Leach.*

Doug. and Scott, p. 593; *Don.* vol. v. pl. 176.

A generally-distributed species, in quiet or stagnant waters, amongst weeds, in summer.

AFFINIS, *Leach.*

Trans. Linn. Soc. vol. xii. p. 18; *Doug. and Scott*, p. 595.

In stagnant water, amongst vegetation; Plymouth (Dr. Leach).

HIEROGLYPHICA, *Duf.*

Doug. and Scott, p. 598.

In a pond near Marsh Barton, Exeter, in April; plentiful.

STALI, *Fieb.*

Doug. and Scott, p. 597.

Abundant in salt-water ditches, at Seaton and Topsham, in June and September.

FALLENII, *Fieb.*

Doug. and Scott, p. 607.

Captured in the Exeter district, but not common.

SALBERGI, *Fieb.*

Doug. and Scott, p. 600.

In ditches in the marshes at Exminster and Seaton, in June.

STRIATA, Fieb.

Doug. and Scott, p. 606.

Common in ponds and ditches; generally distributed.

DISTINCTA, Fieb.

Doug. and Scott, p. 608.

Taken in the Exminster marshes, in June.

SEMISTRIATA, Fieb.

Doug. and Scott, p. 602.

In ditches, in the Exminster and Seaton marshes, in June; not common.

FOSSARUM, Leach.

Trans. Linn. Soc. vol. xii. p. 17; Doug. and Scott, p. 611.

In ditches and ponds, in various parts of the county, in June.

GENUS, SIGARA, Fabricius.**MINUTISSIMA, Linn.**

Dr. Leach, vol. xii. p. 14; Doug. and Scott, p. 616.

In the river Tavy (Dr. Leach) and in Ide Brook, among weeds, in June; numerous where they occur. This little species might easily be taken for one of the Coleoptera, as its mode of progression and its colouration resemble one or two species also inhabiting the same localities. This, therefore, requires a close examination to distinguish it.

NOTES ON NOTICES OF THE GEOLOGY AND PALÆONTOLOGY OF DEVONSHIRE.

PART XI.

BY W. PENGELLY, F.R.S., F.G.S.

(Read at Newton Abbot, July 31st, 1884.)

WITH but slight exceptions, the Notes contained in the present Fasciculus have reference to Notices of Kent's Cavern, Torquay.

I. BOLT HEAD, SOUTH DEVON : *The Rev. Beale Poste on the Geology of the.* 1857.

The Rev. Beale Poste's *Britannia Antiqua ; or, Ancient Britain brought within the limits of Authentic History* (1857), to which a friend has recently called my attention, contains the following passage with reference to supposed changes of the coast line of the county of Kent since the time of the Romans :—

"The shingle is composed chiefly of flint stones washed out of the chalk. Its original source has been considered very doubtful, some placing it beyond the Land's End : however, as there is a large detached tract of chalk at and about Bolt Head, between Plymouth and Dartmouth, there seems no occasion for such a supposition. The first great collection of it is at Chesil Bank, near Portland ; where it forms a large mound." (Chap. v. p. 246.)

The statement that "there is a large tract" [= outlier] "of chalk at and about Bolt Head, between Plymouth and Dartmouth," is at once strange, erroneous, and inexplicable. There is a large outlier of Chalk at and about Beer Head, but that, instead of being "between Plymouth and Dartmouth,"

is, as the crow flies, upwards of 30 miles N.N.E. from Dartmouth. On the other hand, there is a considerable outlier not far west of Bolt Head, but instead of being of Chalk, it is Trias, *i.e.* New Redsandstone. I must decline the attempt to correct the author's very decided *Slip*, nor can I follow him beyond the Land's End in quest of Chalk.

II. DEVONSHIRE: the Geology of, including KENT'S CAVERN: *The Century Magazine* on. 1883.

An Article on *The Fairest County in England*—by which Devonshire is meant—which appeared in the *Century Magazine* for December 1883 (xxvii. 163–174) is tolerably replete with *Slips*, as has been pointed out elsewhere (See pp. 608–615 in the present Volume). It is here proposed to offer a few remarks on the Notices of the General Geology of Devonshire and of Kent's Cavern which occur in the Article.

1. *A Brief Mention of Devonshire Geology.*

"Passing over with brief mention the metamorphic rocks, the lias, the oolite, and tertiary formations, the traces of submarine forests and of raised beaches along the coast of Devon, the valley deposits in which have been found the fossil bones of the mammoth and the rhinoceros, the brown-coal beds in which are inclosed the fossils of such exotic plants as the cinnamon and palm, tree ferns, and pines in size like the gigantic Wellingtonia of California." (p. 170.)

In the foregoing quotation, the author, if he has not *slipped* himself, would almost certainly lead his readers to *slip*, into the belief that the Oolitic formation occurs in Devonshire, that there are tertiary formations in the county besides the "brown-coal beds of Bovey Tracey, and that bones of Rhinoceros have been found in our 'Valley deposits,'"—no one of which is true so far as I am aware. On the other hand, he ignores the Trias which covers so large an area within our borders, as well as the Greensand and the Chalk in the eastern part of the county—all deserving and requiring a place in his "brief mention."

2. *The Stalagmite of Kent's Cavern.*

"The fossils were covered by a thick floor of stalagmite which had been formed, there can be no doubt, by great blocks of limestone which had fallen from time to time, extending over a very lengthened period, from the roof of

the cavern, and had become cemented into one mass by the perpetual percolations of lime-water from above." (p. 169.)

The author's notion of Stalagmite is most remarkable and very amusing—"formed by great blocks of limestone which had fallen from time to time, extending over a very lengthened period, and had become cemented into one mass by the perpetual percolation of lime-water from above"! His Webster would have correctly told him that Stalagmite was "a deposit of earthy or calcareous matter, made by calcareous water dropping on the floors of caverns;" and would thus have taught him that any additional matter, whether great blocks of limestone, or grains of sand, or organic remains of any kind, must be regarded as foreign and accidental.

3. *Contents of the "Cave-earth" in Kent's Cavern.*

"Over the original earth-bottom of the" [Kent's] "cave is a bed or layer of considerable thickness, in which are contained strange mixtures of human bones with the bones of the elephant and the rhinoceros, the hyena, the bear, and the wolf, intermingled with stone and flint tools, arrow and spear-heads, and fragments of coarse pottery." (p. 169.)

What the author means by "the original earth-bottom of the Cave," I have not the least idea; but there can be no doubt that his "bed or layer of considerable thickness" was that termed the "Cave-earth." It contained, as he states, "bones of elephant" [= Mammoth] "and the rhinoceros, the hyæna, the bear, and the wolf, intermingled with stone and flint tools." It would have been more definite to write "chert" instead of "stone," and safer to omit the words "arrow and spear heads." The word "tools" is at once sufficient and safe.

It is a very serious Slip to state that there was in the Cave-earth a "mixture of human bones with the bones of the elephant" and his contemporaries; and an equally serious one to add that "fragments of pottery" were "intermingled with the relics of the extinct mammals." The fact is neither the "Cave-earth" nor any deposit below it contained a human bone or a single fragment of pottery of any kind.

III. KENT'S CAVERN. *B. C. Y. on.* 1882.

On 23 December 1883, I received from the anonymous author a presentation copy of a work entitled *The Antiquity*

of Man not Proven: Primeval Man not a Savage. By B. C. Y. It was published in London, and though there is no date on the title page, the Preface is dated "Birmingham, 1882." The Author does not see fit to disclose his name, but it would probably not be difficult to ferret it out. Nevertheless, he shall preserve his anonymity so far as I am concerned.

As might have been anticipated, he devotes a considerable amount of space to Kent's Cavern. Indeed, he says on his second page, "probably it would not be too much to say, that Kent's Cavern with its discoveries, and diligent exponent, has done more to build up the theory of man's remote antiquity than any other locality in Europe."

In the following pages it will be frequently necessary to speak of the Author of the book now under notice; but as his name is a secret, and it might not be considered respectful to refer to him as "B. C. Y.," I purpose calling him the Author, writing the word with a capital initial.

It is proposed to quote from the Author each passage which appears to require or invite remark, and, in order to avoid repetition, to unite with it all closely related passages elsewhere in the volume. In the interest of Simplicity it seems best to take the passages in chronological order, that is to take those first which relate to the most modern of the Cavern deposits, and to proceed thence in due order to those having reference to the most ancient of the deposits.

It will be my endeavour to quote with literal accuracy; to verify all the Author's quotations it may be necessary to requote; to refer to the source whence every quotation is taken; to place within inverted commas every word I quote; to indicate in the usual way any interpolations it may be necessary or desirable to make in a quotation, as well as the excision of any word or words which do not affect the meaning or force of a passage, so that what is mine, as well as what is not, may easily and plainly appear.

It is to be regretted that the Author has seldom been scrupulous or careful in these particulars; and much space and time may probably be lost in the endeavour to put the reader on his guard, and, as far as may be, to repair the passages he has maimed in quoting.

Though he makes no mention of having visited the Cavern, he may possibly have done so, as there appears to be internal evidence of his having been at Torquay. But be this as it may, his acquaintance with its phenomena is neither extensive nor accurate.

As it may be well to familiarize the reader at once with

the Author's procedure, the first quotation shall be devoted to illustrating his mode of quoting and compiling.

I will only add here that the references given at the foot of his pages will always be incorporated in the text at the precise points occupied by his reference marks.

Quoting and Compiling.

Quotation I. "The black mould, which is the first bed in descending order, is found only in those parts of the cavern into which the *entrances* (which are all in the east) immediately open, and such as are prolongations of them' (Glasgow Lect., 1877, p. 8); but was not found in the remote parts of the cavern. (President. Address, *Nature*, 1877, p. 320.)

"The black band occupied an area of about one hundred square feet, not more than thirty-two feet from one of the *entrances* of the cavern.'

"The cave earth was of unknown depth near the *entrances*, but in the remoter parts of the cavern thinned out entirely. (*Ibid.*)

"Below the cave earth, adds Mr. Pengelly, as we get away *south-westerly*, is another stalagmite, viz., the crystalline, and 'where the upper one' (the granular) was five feet, the lower was twelve feet. (President. Address, *Nature*, 1877, Glasgow Lect., 1876, p. 15.)

"In the report of the cave for 1869, we read: 'In proceeding westward, the cave earth thinned out entirely, and disappeared, so that the stalagmites, where was its proper place (*i.e.* between them) rested one immediately on the other.' (Rep. Brit. Assoc., 1869, p. 193.) The upper stalagmite varies in thickness from a mere film to nearly five feet; its average thickness being from sixteen to twenty inches.' (Mr. Pengelly's Manchester Lect., 1872.) 'The lower stalagmite is commonly thicker than the upper, and in *one instance* nearly twelve feet.' (*Nature*, 1877, p. 320.) (The italics are mine.)" (pp. 4-5.)

Quotation I. contains 212 words, without counting the Author's references to authorities, and is broken into five paragraphs. We have first three words from a lecture I delivered at Glasgow in 1877; then, without intimation, an interpolation of eight words, followed by thirteen words from the said lecture; then an interpolation of six words, succeeded by nine additional words from the same lecture.

Then come six words from my Address to the Geological Section of the British Association during the Plymouth Meeting in 1877, then an excision of two words, and, with five additional words from the same Address, the first paragraph is completed.

The second and third paragraphs are from the said Address, but about midway in the second there is an excision of ten words, and in the third there are two excisions, one of seven words, the other of thirteen.

The fourth paragraph opens with four words from a lecture I delivered at Glasgow on 22nd December, 1875, there is then an excision of two words, and the said lecture is resumed for a length of five words, then comes an interpolation of one word, followed by two words from the lecture, then an interpolation of three words, for which we have compensation in the form of an excision of seven words. We run on then with five words from the lecture, and after interpolating two words, the paragraph is completed with twelve words from the lecture. The Author calls in the Address at Plymouth to support the Glasgow lecture; and it no doubt looks well, but the words quoted are all from the lecture.

The fifth paragraph begins with mention of the Report of the Kent's Cavern Committee presented in 1869—about which something further will have to be said presently. After quoting from it six words, excising one, quoting eight, excising one, quoting one, interpolating one, excising two, quoting four, interpolating four, and quoting six words, the said Report is dismissed, and its place is professedly taken by a lecture I delivered at Manchester on 18th December, 1872. The words which, according to quotation marks, were taken from it are twenty-three in number, but instead of a quotation they are a compilation from the said lecture and from a third lecture delivered at the same place on 15th December, 1875. The last so-called quotation—really a compilation—consists of sixteen words which are made to say that they were taken from my Address at Plymouth in 1877.

There must have been a considerable amount of labour in hunting up, selecting, supplementing, and inlaying just the words the Author wished. Some of the results are calculated to make one feel that the process seems somewhat tortuous; that there must be some special purpose to which this labour is intended to lead; and to induce a very watchful, perhaps almost suspicious, frame of mind while one reads.

It is noteworthy that the Author is careful to say in a

parenthesis at the end of Quotation I.—“The italics are mine.” There is a look of fairness about such a statement, and one is perhaps likely to take it for granted that every professed quotation in the piecemeal compilation is word for word; that, for example, as there is not a single indication of an interpolation, or an excision, or an “improvement” throughout Quotation I., there is, accordingly, *no* interpolation, or excision, or “improvement” from end to end.

It is to be feared that the blameworthy practice of making slipshod quotations is very prevalent. I have had again and again to point it out in my “Notes” of previous years (see especially *Trans. Devon. Assoc.* xii. 592–651), and have often detected it in authors of great eminence whose writings did not personally concern me. Occur where it may, however, the practice is neither just to the author quoted, nor calculated to inspire confidence in the accuracy of the writer.

There can be no objection to interpolations, or fair excisions, or both, when quoting, provided the quoter indicates that he has taken liberties of the kind with the original. My contention is that the Author has repeatedly taken such liberties but has given no indication of the fact.

It is but justice to myself to say that my lectures at Manchester and Glasgow, as elsewhere, were not written and read, but spoken; that they were printed from Reporter's notes; and are not strictly accurate. The Author has, I believe, adopted and adapted one of these inaccuracies in the following sentence in the fourth paragraph of Quotation I.: “Where the upper one (the granular) was five feet the lower was twelve feet.” I refer to the initial word “*where*,” italicised by the Author. As he frequently returns to the statement, its consideration shall be deferred to a future page.

The last paragraph of Quotation I. shows us the Author at, perhaps, his best as a Compiler. He begins by calling attention to a passage “in the report of the cave for 1869,” puts the passage within inverted commas, but does not quote it correctly; forgets to say that the said passage is itself a quotation from the Report presented the previous year (1868), to which the Committee wish to make a corrective addition embodying some results of their researches during the twelve months by which the two Reports were separated. The simplest way of showing the Author's mode of getting up a case will, no doubt, be to give in one column the entire passage from the Report in 1869 professedly quoted by the Author, and his professed transcription of it in another and parallel column:—

Original.

"In the Fourth Report (1868) the Committee stated that they were occupied in excavating that portion of the Cavern termed the 'South-west Chamber,' which, so far as was then known, was the last or most south-westerly branch of the Eastern Series of Chambers and Galleries. . . . It was added that in proceeding westward the Cave-earth had thinned out entirely and disappeared, so that the two Stalagmites, between which was its proper place, rested one immediately on the other.

"Soon after that Report was presented, the Committee found that a few feet beyond the point where they had lost the Cave-earth, it once more appeared in the section, occupying its accustomed position between the Stalagmites, resting on the Old crystalline mass, and overlaid with that which is granular and comparatively modern." (*Rep. Brit. Assoc.*, 1869, pp. 192-3.)

Author's Transcript.

"In the report of the cave for 1869, we read: 'In proceeding westward, the cave earth thinned out entirely, and disappeared, so that the two stalagmites, where was its proper place (i.e. between them) rested one immediately on the other' (*Rep. Brit. Assoc.* 1869, p. 193)."

The Author can, no doubt, say why he did not quote fully and correctly; but, whatever his motive, the effect must of necessity be false impressions on the mind of the reader, who would, of course, conclude

(1) That the reported thinning out of the Cave-earth occurred in the south-western part of the entire Cavern, instead of in the south-western part of the Eastern Division of the Cavern.

(2) That after the thinning out spoken of, the Cave-earth never re-appeared anywhere in the Cavern.

I cannot take leave of Quotation I. without remarking that it has the appearance of giving a complete and orderly enumeration of the Cavern deposits, in descending order; but this is quite illusory. The first paragraph is devoted to the Black Mould—the first deposit; but the Granular Stalagmite is, at least for the time, passed silently by, the second paragraph being entrusted with the Black Band—the third deposit. The Cave-earth—the fourth deposit—occupies the third paragraph; and in the fourth paragraph mysterious mention is made of "another stalagmite, viz. the crystalline"—the fifth deposit. But though this is introduced as "another," it

is the first stalagmite mentioned in the Quotation; nevertheless, it prepares at once a sort of back stair entrance for what the Author calls "the upper one (the granular)." The sixth, the lowest known deposit termed the Breccia, is altogether ignored. It is a droll disjointed compilation.

Order and Position of the Beds.

Quotation II. A. "In testing the calculations of time said to be required for the formation of the several layers deposited in Kent's Cavern, it is requisite that we should ascertain the

"Order and Position of the Beds.

"They do not lie one on the other in vertical succession, but mostly side by side, so that two or more would have been forming at the same time." (p. 4.)

B. "It is evident that the black mould, the cave earth with the black band, and the beds of stalagmite, do not lie in vertical succession, which will greatly alter the estimate of time required for their accumulation." (p. 5.)

C. "The layers of *Cave Earths*, we might assume, were deposited in about the same time as the stalagmitic beds which formed at their sides." (p. 11.)

D. "There are no data that will enable us to fix on a term of years required for the formation of the cave earth; but the supply of the material of which it is formed, and its side-long position in relation to the stalagmite, indicate rather a short than a lengthened period for it, together with the black mould, to fill up the space beside the stalagmites." (p. 13.)

It will be seen that, in Quotation II., the Author states—not as an opinion, but as the most unqualified fact—that the Cavern deposits "do not lie one on the other in vertical succession, but mostly side by side;" and that he makes virtually the same statement at least four times. I make no apology for claiming that my statement on this question ought to be worth rather more than that of the Author. With but few exceptions I was at the Cavern every day from the beginning to the end of the exploration—28th March 1865 to 19th June 1880; saw and inspected all the sections, and made memoranda on the spot; while the Author makes no claim, and, judging from his descriptions is not entitled to make any claim, of having ever seen the Cavern.

I state in the most unqualified way,

(1) That the deposits were, in descending order, 1st or

uppermost, The Black Mould ; 2nd, The Granular Stalagmite ; 3rd, The Black Band ; 4th, The Cave-Earth ; 5th, The Crystalline Stalagmite ; and 6th or lowest known, The Breccia.

(2) "That the beds present in every section lay one on the other in vertical succession, and never side by side ; so that no two or more of them in any section could ever "have been forming at the same time."

(3) That the order of succession given above, though not always complete, was never transgressed—the Breccia, for example, never lay on the Crystalline Stalagmite, nor on any other deposit the normal place of which was above it ; and so on with each of the other deposits. Indeed, the Author has no doubt read the following passage in my Address at Plymouth :—"Wherever all the deposits were found in one and the same vertical section, the order of superposition was clear and invariable ; and elsewhere the succession, though defective, was never transgressed." (*Brit. Assoc. Rep.*, 1877, *Trans. of Sects.* p. 59 ; or *Nature* xvi. 320. 1877.)

Objects found in the Black Mould.

Quotation III. "The black mould contains Romano-British and Pre-Roman articles, such as bronze rings, spoons, etc., smelted copper, combs, pottery distinctly Roman in character, including fragments of Samian ware. From the presence of these Roman relics, Mr. Pengelly claims for the formation of the black mould at least 2,000 years. But this assumes that Roman pottery found its way directly from the place where it was wrought by the potters to the place where it was deposited, and that Samian ware reached our island straight from the manufacturers, was at once broken into 'fragments,' and thrown into the Devonshire Cave. It is difficult, too, to understand how, under ordinary circumstances, Roman pottery, including Samian ware—the combs of the misses and the combs of the maids,' as Mr. Pengelly facetiously calls them—with a number of ladies' trinkets, should find their way to the cave. Surely people who possessed articles of value, and who kept servants or slaves, would not elect to dwell in the dens and caves of the earth, and carry thither articles of value and ornament." (p. 11.)

The Author does not tell us explicitly whence he obtained the materials for the passage forming Quotation III.; but from internal evidence it was, no doubt, mainly from the Report of my first lecture at Glasgow (22nd December, 1875),

with a slight flavouring from the Report of what was essentially the same lecture delivered at Manchester three years before (18th December, 1872). His enumeration of the objects found in the Black Mould is by no means exhaustive; but it was, no doubt, carefully selected, and I don't mind confessing that it has been slightly "improved."

The Author places in his list "pottery distinctly Roman in character, including fragments of Samian ware." My statement is "numerous potsherds including a piece of Samian ware" (*Lect. Glas.* 22nd December, 1875, p. 17), but I use no such words as "distinctly Roman," and the Author has been so good as to multiply my solitary "piece of Samian ware" into "fragments of Samian ware." He gives his readers, but not on my authority, the information that "From the presence of these Roman relics, Mr. Pengelly claims for the formation of the black mould 2,000 years," and he ignores the fact that just two lines above he had mentioned the presence of "Pre-Roman articles." My words were, according to the reporter, "Many of the artificial objects go back to Romano-British and Pre-Roman times. Hence the black band or uppermost deposit is worth two thousand years at least; and may be worth much more." (*Ibid.*) This estimate was based especially on the *bronze* objects, and chiefly, amongst them, on the spearhead and socketed celt mentioned in the list from which the Author compiled. The spearhead, it may be added, was also socketed. The Author may have been assisted to forget them by remembering the fact that antiquaries place the Age of Socketed Bronze Celts and Spearheads in Britain from about the Christian Era backward to 400 or 500 B.C. (See *The Ancient Bronze Implements . . . of Great Britain and Ireland.* By John Evans, D.C.L., LL.D., F.R.S., &c., p. 473. 1881.)

The Author is of opinion that "It is difficult to understand how, under ordinary circumstances . . . 'the combs of the misses and the combs of the maids,' as Mr. Pengelly facetiously calls them, with a number of ladies' trinkets, should find their way to the cave. Surely," he adds, "people who possessed articles of value, and who kept servants or slaves, would not elect to dwell in the dens and caves of the earth, and carry thither articles of value and ornament." I plead guilty to the charge of facetiousness, and am thankful that the Author detected it. The error slipped from me at Manchester (See *Manch. Lect.* 18th December, 1872), but the Author has not quite caught its meaning. I was describing the bone combs, and said "some of them were

beautifully ornamented and some of them were rude. I fancied I could distinguish the comb that belonged to the 'missus' and the comb that belonged to the servant-maid." The Author has substituted "misses" (= young unmarried ladies)—a word I certainly did not use—for "missus" (= a provincialism or vulgarity for "mistress")—which the reporter correctly says I did use; and it is a little amusing to find that while the Author saw the expression was facetious, he also regarded it as a serious statement of opinion. As a matter of fact I have always declined to say whether the combs belonged to men or to women, whether they were used for combing hair, or combing threads for making nets, or for any other purpose.

I am quite at a loss to understand what were the "ladies' trinkets" which according to the Author found "their way to the cave." There are none mentioned in his list, nor do I detect any in mine, except, perhaps, some amber beads which he ignores. A few such beads were certainly met with, but I have ventured on no opinion as to whether they were "trinkets," whether they belonged to men or to women, or whether they were coeval with the bronze articles, or the pieces of Samian ware, or neither. Nor do I know whether the owners of the articles kept servants or slaves. The Author opines they did, and I shall have no objection to believe it as soon as it is proved.

Stalagmite as a Time-gauge.

Quotation IV. "This stalagmite is the principal time-gauge used to show that the deposits of Kent's Cavern have required a prodigious time for their formation.

"An extract from one of Mr. Pengelly's lectures will give the calculation by which this conclusion is reached. He is lecturing in the Hulme Town Hall, Manchester, at the end of 1873. He has popularized his subject, and has evidently an attentive audience. 'Well, I have told you,' he says, 'that we have found Romano-British and Pre-Roman objects in the black mould. We feel perfectly satisfied that this deposit is worth as a minimum 2,000 years. Now comes the question, how much time does the granular stalagmite represent? A stalagmitic floor cannot be formed faster than the limestone overhead is dissolved, and the rate at which this is dissolved depends on the amount of carbonic acid in the water. We feel perfectly satisfied it must be very slow work. On a boss there is the following inscription:

"Robert Hedges, Feb. 20, 1688." That is 185 years ago. There is another inscription which had not been noticed till last June, which is earlier still, dated 1604, that is 269 years old. Let us say 250—we can afford to be liberal. Now how much carbonate of lime has accreted on those ancient inscriptions made 250 years ago? Not more than the twentieth of an inch in thickness in a part of the cavern where the stalagmite has been formed with unusual rapidity. Judging from these bosses, you perceive clearly enough that it would take twenty times that amount of time to represent an inch, that is 5,000 years, and we have fully five feet to account for in the granular stalagmite only. Now, ladies and gentlemen, are you prepared for that amount of time? Five thousand years for an inch, and sixty inches—sixty times 5,000 years. What then? After you have got below the cave-earth you have another stalagmite little short of twelve feet in thickness, and you have that to account for in addition.' (pp. 129-131.) We must not omit to say that, cautioned by the rapid accumulation of stalagmite in a cave in Yorkshire, the lecturer added: 'I am not prepared to insist on your receiving this rate of increase as a chronometer. I am willing to admit that it may have been faster, for anything I know to the contrary; but supposing it were fifty times as fast—and that I take to be a very high estimate indeed—were our fathers prepared for the reception of the time thus obtained?' Yet Mr. Pengelly repeats his calculation in his lectures at Glasgow in 1876 and 1877 (pp. 31, 10); and at the close of his presidential address at the meeting of the British Association in 1877, says that the state of the evidence from Kent's Cavern compelled him to believe that the earliest men of Kent's Hole were interglacial, if not pre-glacial. (*Nature*, 1877, p. 320.)" (p. 7.)

Almost the whole of Quotation IV. is confessedly taken from my second lecture at Manchester (17th December, 1873), and is broken by the Author into two portions, the whole of each being within quotation marks, and without indication of interpolation or excision. The Author, however, has taught us that he should be carefully watched, and he proves to be true to his instincts. It may be admitted that his interpolations on this occasion are so few and brief that they may be ignored; but his excisions are of another complexion. We begin with a great run of 16 words fairly quoted, but followed by an excision of 17; then a quotation of 4, an excision of 1, a quotation of 11, followed by an excision of

165. We start again with a quotation of 12 words, then an excision of 21, a quotation of 30, an excision of 3, a quotation of 4, an excision of 1, a quotation of 6, and then a grand excision of 423 words. We next get under weigh by quoting 3 words, and, having stopped to excise 2, quote 7 more, again excise 2, quote 48, and then excise 148. Finally, by quoting 27 words, excising 69, quoting 35, excising 3, and quoting 79, we reach the end of the first portion of Quotation IV. The second portion consists of 64 words quoted without further blemish than a small interpolation.

The excisions, in addition to the unusual and unjustifiable course of being made without any indication, are all more or less important and unfair; and some of them affect my argument seriously. But waiving all this, for the time at least, the inscription which the Author gives incorrectly as "Robert Hedges, Feb. 20th, 1688," is really "Robert Hedges, of Ireland, Feb. 20th, 1688," as stated in the report of my lecture. This unfortunate inscription seems doomed to be badly treated. Mr. Mac Enery mentioned it at least four times, but never quoted it correctly, though every character in it was perfectly legible. (See *Rep. Brit. Assoc.* 1875, p. 7; see also *Trans. Devon. Assoc.* v. 208.)

The Author, as we have seen, suspended his transcription at one point in Quotation IV. This he did for the purpose of remarking "that cautioned by the rapid accumulation of stalagmite in a cave in Yorkshire, the lecturer" [Mr. Pengelly] "added: I am not prepared to insist on your receiving this rate of increase as a chronometer," &c. According to the reporter I had devoted nearly 150 words in my lecture to the "Cave in Yorkshire," but they formed part of one of the passages excised by the Author, as already stated. The Cavern was that known as Clapham Cave, in Ingleborough; the observations on its stalagmites had been made by my friend Professor Boyd Dawkins, of Manchester, and as the Paper in which they had been given to the world was read in that city early in the year of my second lecture, there can be no doubt that it would have been discourteous to have made no allusion to it when lecturing on a cognate question at almost his very door. The Author is in error, however, if he supposes that the said observations or Paper had in the least degree affected my opinion respecting the chronology of the Kent's Cavern Stalagmites. In fact, the following words, as the Author is well aware, occur in the printed report of my lecture: "I doubt, however, whether it is at all wise to apply the rate at which stalagmite is formed in one

cavern as a measure of the time represented by the stalagmite existing in another cavern. I know perfectly well that the rate at which stalagmite is formed in some branches of Kent's Cavern is utterly unlike that at which it is formed in other branches of the same cavern." (p. 130.) The Author is also aware that I am reported to have used the following words in my second Glasgow lecture: "A good deal has been said about the rate at which the masses of stalagmite in Ingleborough Cave, in Yorkshire, have been formed, and a friend of mine has made some interesting observations on the mass called the Jockey Cap. I saw that mass last September, and am perfectly satisfied that the measurements of it just alluded to are utterly valueless for a measurement of the time represented by anything else than the Jockey Cap itself." (p. 10.)

I have dealt somewhat fully, more than once, with the Jockey Cap (see *Trans. Devon. Assoc.* vi. 664-671, xii. 605-6, and xiv. 669-672); and, though there is room for something further to be said on it, do not feel called on to re-open the question now. It may be stated, however, that as long ago as 1872, that is more than a year before the Manchester lecture now under notice, and several months before Professor Boyd Dawkins read his Paper just mentioned, I had printed the following words when treating of the rate at which stalagmite had accreted on the Kent's Cavern inscriptions:—"Though it is not forbidden by any known fact, it may be unsafe, and therefore unwise, to take this rate as a chronometer; but even if a much higher rate be taken, it will be seen that the three feet of thickness to which the floor sometimes attains, or even the sixteen or twenty inches which it averages, must be of very great chronological value." (*The Ancient Cave Men of Devonshire. Chambers's Miscellany*, p. 14, 1872.)

The Author seems to think it strange that I repeated my calculations in the lectures at Glasgow in 1875 and 1877; but he gives no reason why they should not be repeated anywhere. The same course was followed at Glasgow as at Manchester. The known facts were stated, and were supplemented with cautionary remarks equivalent to those used at Manchester; and it was added, "Below that" [the Granular Stalagmite] "comes the Cave-earth, and below that again the prodigiously thicker crystalline stalagmite, and still below that the breccia." (*Glas. Lect.* 1875, p. 32; see also my *Second Glasgow Lecture*, 1877, pp. 8-13.)

The Author adds that "at the close of his presidential

address at the meeting of the British Association in 1877" [Mr. Pengelly] "says that the state of the evidence from Kent's Cavern compelled him to believe that the earliest men of Kent's Hole were interglacial if not preglacial." He has not quoted with verbal accuracy, but he has stated with substantial correctness the belief I avowed then, and which I avow still; but he knows, or he ought to know, that the Stalagmites formed no part of the evidence on that point, which would remain unaffected by a short chronological value of the stalagmites.

Date of the Extinction of the Mammoth, Cave Bear, Woolly Rhinoceros, and Cave Hyæna, in Devonshire.

Quotation V. "In his lecture in Manchester in 1873, Mr. Pengelly says, 'I have myself taken out of the granular stalagmite teeth of the mammoth, teeth of the extinct cave bear, teeth of the extinct *tichorhine* (woolly) *rhinoceros*, and teeth of the *hyæna*, which, only partially buried in the stalagmite, were jutting up an inch and a half in relief in some instances.' (p. 129.)

"From his address to the Devonshire Association for the Advancement of Science, we obtain further information respecting these four early extinct animals. They were, we learn, 'so little below the surface of the stalagmite, that not more than an inch and a half at most of calcareous matter had formed since they were lodged where they were met with.'

"'In the north sally-port,' we are told, 'so long as it presented itself, the overlying black mould yields potsherds, marine shells, and bones, chiefly modern, but a few extinct animals, the astragalus of the rhinoceros being the most important of the latter.' (*Rep. of Brit. Assoc.*, 1870, p. 23.)

"From these statements we find that the teeth of four remarkable extinct animals were found lying on the upper surface of the granular floor above the works of skillful artificers, and jutting up an inch in relief, with at most not more than an inch and a half of the stalagmitic matter formed around them.

"If we could find how long this inch and a half of calcareous matter was in forming, we should be able to measure pretty accurately the time that has elapsed since these remains were deposited. According to the rate of increase at the Ingleborough Cave, the inch and a half would have formed in six years; but we will suppose—not conceding it

—that in this case it took 150 years to form. The black mould was from three to twelve inches thick, and does not appear to overlie the stalagmite through all this part of the cave, and not improbably was thinning out at this spot. As, however, it is difficult to find the exact position of these remains, we will add for the formation of that deposit, and the time that has elapsed since its deposition, 1500 years. Then, assuming that the black mould did overlie the granular floor at this part of the cave, these teeth of the mammoth, the woolly rhinoceros, the cave bear, and the hyæna were deposited on the surface of the granular stalagmite floor less than 1700 years ago." (pp. 55-56.)

Quotation V., it will be seen, consists of five paragraphs, the first three being confessedly quotations, while the last two are speculations on them. The first paragraph is a quotation from my second lecture at Manchester (17th December, 1873). It is not word for word, but the Author has taught us not to expect that from him. The only serious liberty he takes, however, is the substitution of the words "*tichorhine* (woolly) *rhinoceros*" for the unqualified word "*rhinoceros*," which, according to the reporter, I used. This was a little hazardous, as the Caves of Devon have yielded remains of two species of *Rhinoceros*.

That which, in the second paragraph, the Author calls my address to the Devonshire Association, was simply a Paper entitled *Notes on Recent Notices of the Geology and Palæontology of Devonshire*. Part I. As the Author failed to mention where it occurs, it may be as well to say that the passage quoted will be found in *Trans. Devon. Assoc.* vi. 666 (1874), and is quoted with substantial correctness.

It may be well, perhaps, to devote a few words here to the admitted occasional occurrence of a relic of an extinct Mammal in the Black Mould; and the most desirable course is to begin by quoting what Mr. Mac Enery, the earliest real explorer of the Cavern, says on the subject. When describing his first visit to that, or indeed to any, cavern, he says "I betook myself alone, to a spot which had the appearance of having been disturbed. It was one of those perforations in the floor which further observation enabled us to trace to burrowing animals situated half-way down the . . . Sloping Chamber, in a cove on the right against the wall. The mouth was partially choked up with soil of which a heap was thrown up around its margin. It was slightly glazed over with the drop" [= Stalagmite.] "The earth was of a

reddish brown, unctuous to the touch, and from the presence of a profusion of recent bones bore evident marks of frequent disturbance.

"On tumbling it over, the lustre of the enamel soon betrayed its contents. They were the first fossil teeth I had ever seen." (*Trans. Devon. Assoc.* iii. 209-210, 1869.)

Again, when describing one of his excavations in a branch of what he called the Upper Gallery (now known as the "Eastern Division") at a considerable distance from the Sloping Chamber, he says "We found the floor very irregular, consisting of masses imbedded in the stalagmite or of an aggregation of loose stones cemented together by the same substance. In this breccia were found articles of flint and in one instance a fragment of pottery; but what struck us as most singular was a layer of reddish mud which overspread the stalagmite in this part. Our surprise was still greater when in searching for pottery and the other articles already mentioned as occurring here, we fell in with fossil teeth in it. We were at a loss to divine its source, when in proceeding with our operations below the stalagmite the mystery cleared up. We found to our amazement that the entire region was traversed in all directions by sewer-like tunnels sufficiently large and extensive to permit a man to range in a creeping posture over the bottom of the Cavern.

"A regular system of subterranean passages was excavated in the soil. . . . On one occasion the soil yielded under me several ft. . . . The earth escaped into a vertical cavity in the floor, of which we subsequently availed ourselves for discharging the excavated soil. . . .

"The spectacle presented by these tunnels . . . was almost worth the risk. Scattered along the floor lay the recent jaws of Sheep, Deer, &c., intermixed with fossil, while projecting from the floor and sides appeared the remains of some twenty species of fossil quadrupeds.

"The roof too exhibited the appearance of being studded with teeth and jaws. . . .

"The reader will have anticipated me in referring the loose marl on the upper surface to the tunnels. It was thrown up by the animals which burrowed through the subterranean soil. They took advantage of the uncovered parts which were screened from the drop" [of calciferous water] "by the overlapping of fallen masses, to penetrate thro it into the body of the cavern from their excavation below." (*Ibid.* 232-4.)

To very much the same effect is his description of the two

branches of the Eastern Division of the Cavern to which he gave the name of the "North" and "South Sallyports."

It must be added that, as every reader of the Reports by the Kent's Cavern Committee is aware (See *Reps. Brit. Assoc.* from 1865 to 1880 inclusive), it was Mr. Mac Enery's practice to leave in heaps, near the places whence they were dislodged, the materials he dug up in various parts of the Cavern; that these heaps contained a very large number of bones, as well as no inconsiderable number of human industrial remains, which he had overlooked or neglected; and that the said relics, thus thrown confusedly together, represented all and each of the deposits dug up near each heap.

The confusion thus produced was at least in some instances intensified, if possible, by the heaps just spoken of being subjected to a second search. "It was feared," says Mr. Mac Enery, "that in the ardor of the first search facts of importance might have been overlooked; the mass of mould thrown up on the former occasion was therefore a second time turned over and carefully searched." (*Ibid.* 289.)

It must be also added that, from the close of Mr. Mac Enery's researches—certainly before 1834—up to 1865, with but a very brief interval in 1846, the Cavern was resorted to again and again by large parties of revellers, disturbing everything they could disturb, and levelling inequalities in the floor preparatory to the nocturnal dance.

Taking into consideration the visits and action of the bacchanals, the heaps of imperfectly investigated deposits excavated by the early explorers, and the labours of burrowing animals both in the original deposits and in Mac Enery's excavated heaps, it is wonderful, not that a few relics of extinct mammals were found in and on the Black Mould, but that so very few were thus met with.

Few or many, however, the difference in their mineral conditions was so obvious that a short apprenticeship enabled the Cavern explorer to say with certainty, by this test alone, whether a bone belonged to the Black Mould, or to the Cave-earth, or to the Breccia.

Turning now to the teeth found in the Granular Stalagmite, and in some instances projecting above it, as stated in the first and second paragraphs of Quotation V. It is obvious that the Author wishes to establish the proposition that the Mammoth, Cave Bear, Woolly Rhinoceros, and Cave Hyæna did not become extinct in Devonshire until comparatively recent times. He says (4th Par., Quot. V.) their teeth "were

found lying *on* the upper surface of the granular" [Stalagmitic] "floor above the works of skilful artificers." The preposition "on," which I have italicised, is no doubt very skilfully introduced, but it would never have occurred to me that I was justified in using it, especially after having just admitted that the relics extended at least as far below the upper surface as in "some instances" they rose above it. I must confess to being utterly at a loss to understand to what "skilful artificers" the Author alludes.

The last paragraph in Quotation V. is, at least, amusing, and, if on no other account, deserves analysis and preservation. The author makes a chronological guess, based on sundry assumptions, which, for anything he has shown, are themselves utterly baseless.

He tacitly assumes that the relics of the four species of animals to which he directs special attention, were all found in, or very near, one and the same spot.

When he states that "If we could find how long this inch and a half of calcareous matter" [= Granular Stalagmite] "was in forming, we should be able to measure pretty accurately the time that has elapsed since these remains were deposited," he almost takes away one's breath. His proposition may be expressed in perhaps the simplest way in the form of the following equation:—

$$x + y + z = w,$$

where x is the time represented by the 1·5 inch of Granular Stalagmite, y is such time as may have separated the era of the Granular Stalagmite from that of the Black Mould, z is the time represented by the Black Mould itself, and w is the time that has elapsed since the teeth in question were deposited—all being unknown quantities. According to the Author, x being found, y and z , and consequently w , can be found. He fails, however, to make any attempt to point out how this triumph in equations can be achieved.

He then proceeds to say "According to the rate of increase in the Ingleborough Cave, the inch and a half would have formed in six years;" and the reader supposes, of course, that use is here made, but without distinct acknowledgment, of Professor Boyd Dawkins's Paper on the Ingleborough Stalagmites (*Proc. Phil. Soc. Manch.* 18 March, 1873, pp. 83–6), but on turning thither he will not find a word about any accretion in Ingleborough Cave amounting to 1·5 inch in 6 years, that is ·25 inch per year, though he will find four distinct sets of data, from as many distinct sets of measurements in that Cavern, which give the four distinct annual

rates of .0014 inch, .0068 inch, .043 inch, and .3 inch—increments which vary as the numbers 1, 5, 31, and 214. (See *Trans. Devon. Assoc.* xiv. 671, 1882.) Hence 1.5 inch would be precipitated at the first rate in about 1,070 years, at the second rate in about 220 years, at the third rate in about 35 years, and at the fourth rate in about 5 years. The reader would probably and reasonably object that, inasmuch as there were four distinct rates of accretion in Ingleborough Cave, it must be utterly useless to employ anyone of them in measuring Kent's Cavern Stalagmites. If, however, he feels it more satisfactory to take one of the rates he is as fully entitled to take the first as to take the last; to hold that the 1.5 inch of Stalagmite represented 1,070 years as that it represented 5 years.

While Professor Boyd Dawkins says nothing whatever about a rate of accretion in Ingleborough Cave amounting to .25 inch per year, he does say, "It is evident from this instance of rapid accumulation, that the value of a layer of stalagmite, in fixing the high antiquity of deposits below it is comparatively little. The layers, for instance, in Kent's Hole, which are generally believed to have demanded a considerable lapse of time, may possibly have been formed at the rate of a quarter of an inch per annum."

I quoted these words in what the Author calls my address to the Devonshire Association (*Ibid.* vi. 665, 1874), and there in all probability, but not in the original, he read them. There he read also the following remark made by myself on the passage:—"Taking the suggested chronometer of a quarter of an inch for a year, we arrive at the startling but inevitable conclusion that *Rhinoceros tichorhinus* and his contemporaries were living in the Torquay district about six years ago." (*Ibid.* pp. 666-7.) It must be unnecessary to add that the rate of .25 inch per year is purely imaginary and has not been observed anywhere so far as I am aware.

The Author is clearly not unacquainted with Professor Boyd Dawkins's *Early Man in Britain* (1880), but seems to have overlooked the following passage in it, where the Stalagmites of Ingleborough Cave are contrasted with those of Kent's Hole:—"It therefore follows that very great thicknesses may be formed in a short time; while, on the other hand, it may take a long series of centuries to form a thin layer of a few inches." (p. 264.)

The Author, however, being apparently afraid to follow where his Ingleborough chronometer would lead him, makes, without the least reason assigned, just as if he were at an

auCTION, a bid of "150 years" for the 1·5 inch of stalagmite, that is at the rate of ·01 inch per year; but, afraid of being too liberal, he does it under protest in the following form: "We will suppose—not conceding it—that in this case it took 150 years to form."

He then goes on to say—still quite gratuitously—"The black mould . . . does not appear to overlie the stalagmite through all this part of the cave," and adds, with increase of recklessness, that it was "not improbably thinning out at this spot." Feeling apparently that he had been somewhat daring, he admits that "it is a little difficult to find the exact position of these remains;" and then makes another unexplained bid of "1,500 years" for the formation of that deposit" [i.e. the Black Mould], "and the time that has elapsed since its deposition;" and finally enunciates his conclusion in the following words:—"These teeth of the mammoth, the woolly rhinoceros, the cave bear, and the hyæna were deposited on the surface of the granular stalagmite floor less than 1700 years ago." To be exact he should have said "about 1,650 (= 150 + 1500) years ago;" in other words, "about the year A.D. 230."

On reading this last paragraph of Quotation V. one is inclined to ask

(1.) Whether the Author's method would not enable one to prove anything and everything one wished?

(2.) How it came to pass that none of the Romans who visited Britain, from Julius Cæsar to Severus, made any mention of at least the Mammoth and the Rhinoceros, which according to the Author must have been their contemporaries?

There is at least one point which the Author has failed to consider. Archæologists recognize a Neolithic Age (=the Age of Polished flint tools), older than the Bronze Age, but not so old as the Palæolithic Age (=the Age of Unpolished flint tools). Now the Human Industrial Remains found in the Black Mould of Kent's Cavern take us certainly back to the Bronze Age, but do not certainly, or probably, take us farther; while the moment we enter the Granular Stalagmite we are certainly in the Palæolithic Age. The Neolithic Age is probably unrepresented by the deposits of the Cavern, and this must be recognized in any scheme of the Cavern chronology. The Author is no doubt aware of this fact, as prominence is given to it in my second Glasgow Lecture.

Objects found in the Granular Stalagmite, the Black Band, and the Cave-Earth, collectively.

Quotation VI. "The contents of these three layers are taken together. They contain remains" [sic] "of Cave hyæna, horse (*equus caballus*), *Rhinoceros tichorhinus* (woolly rhinoceros), gigantic Irish deer (*cervus megaceros*), *Bos primigenius* (ursus)" [sic], "*Bison priscus* (red deer)" [sic], "Mammoth (*elephas primigenius*), cave bear, wolf, fox, grisly bear (*ursus ferox*), reindeer (*cervus tarandus*), cave lion (*felis spelæa*), glutton (*gulo biscus*)" [sic], "*Machairodus latidens* (sabre-toothed lion), and man—the last being part of a jaw, with teeth in the granular stalagmite; implements made of flint and chert, flint flakes, chips and 'cones'" [sic], "whet-stones, a hammer-stone, 'dead' shells of pecten, bits of charcoal, and bone tools, including a needle or bodkin having a well-formed eye; a pin, an awl, three harpoons, and a perforated tooth of badger. (Mr. Pengelly's Presidential Address at Brit. Asso., 1877. Rep. Brit. Asso., 1877. Mr. Pengelly's Lect. at Glasgow, 1876.)" (p. 3.)

The Author no doubt compiled his list of Mammals from my Address at Plymouth (see *Rep. Brit. Assoc.* 1877, *Trans. Sects.* p. 59, or *Nature*, xvi. 320); but in self-defence, and in order to show the "improvements" he has made through excisions, transpositions, prefixes, and affixes, it seems right to place in parallel columns the original and his compilation:

Original.

"So far as they have been identified, the remains belong to the Cave Hyæna, *Equus caballus*, *Rhinoceros tichorhinus*, Gigantic Irish Deer, *Bos primigenius*, *Bison priscus*, Red Deer, Mammoth, Badger, Cave Bear, Grizzly Bear, Brown Bear, Cave Lion, Wolf, Fox, Reindeer, Beaver, Glutton, *Machairodus latidens*, and Man."

Author's Compilation.

"They contain remains of cave hyæna, horse (*equus caballus*), *Rhinoceros tichorhinus* (woolly rhinoceros), gigantic Irish deer (*cervus megaceros*), *Bos primigenius* (ursus), *Bison priscus* (red deer), mammoth (*elephas primigenius*), cave bear, wolf, fox, grisly bear (*ursus ferox*), reindeer (*cervus tarandus*), cave lion (*felis spelæa*), glutton (*gulo biscus*), *Machairodus latidens* (sabre-toothed lion), and man."

It is difficult to detect anything like system in the "improved" transcript. In some instances the supposed scientific names occur as prefixes, in others as affixes. The Author commonly uses italics for scientific names, but in one instance he makes Roman characters suffice. In the majority of cases the scientific names occupy parentheses,

but in, at least, three this distinction is given to the popular names instead. The Author is mistaken in supposing that *Bos primigenius* belongs to the genus *Ursus*. It is the scientific name of the Wild Bull, not of a Bear. He is in error also in supposing that "*Bison priscus*" and "Red Deer" are synonymous. *Bison priscus* is a species of a sub-genus of the genus *Bos*=Ox; and is by some Zoologists held to be the same species as the existing *Bison europæus*. The scientific name of the Red Deer is *Cervus elaphus*, not *Bison priscus*. The Author omits in his transcription the Badger, Brown Bear, and Beaver, but assigns no reason for doing so. Finally he has not bestowed sufficient care in correcting the press: thus, the third word in the transcript should have been "remains," not "remans," and the scientific name of the Glutton is "*Gulo luscus*," not "*Gulo biscus*."

The Author's list of Human Industrial Remains is fully and correctly copied, with a solitary but rather serious exception. Instead of "flint flakes, chips, and 'cones,'" he should have written flint flakes, chips, and "cores"—the last word being the name given to the remnant of a flint nodule from which flakes have been dislodged.

Mammalian Remains in the Cave-earth.

Quotation VII. A. "From a table given in the report of the British Association, we learn that in the cave earth of Kent's Hole the percentage of teeth found is:

"In South Sallyport: Hyæna, 27; horse, 29; sheep, 7; fox, 3; elephant, 2; ox, 1; wolf, .5; horse, dog, pig, .5 each; rhinoceros, 11.

"North Sallyport: Hyæna, 31; rhinoceros, 16; rabbit, 2; elephant, 2; lion, 2; ox, 1; wolf, .5; horse, dog, and pig, .5 each.

"Charcoal" [Cave]: "Sheep, 1; hyæna, 44; horse, 25; rhinoceros, 15; ox, 1; wolf, 1.

"Long Arcade: Hyæna, 41; horse, 21; rhinoceros, 9; fox, 4; machairodus latidens, 1; pig, .5.

[Cave of] "Rodentia in second foot of cave earth. Teeth of hyæna, rhinoceros, bear, elephant, lion, and one tooth of a sheep.

"In this cave the remains of this devourer of flesh are mingled with remains of horse, ox, wolf, fox, rabbit, dog, sheep, and pig. And the remains of these modern and domestic animals are largely mingled with those of extinct mammalia." (pp. 42-43.)

B. "In the second foot of cave earth in the cave of rodentia, the tooth of a sheep was found with teeth of rhinoceros, hyæna, bear, elephant, and lion. In the north sallyport the teeth of hyæna, rhinoceros, elephant, and lion were commingled with remains of ox, wolf, horse, dog, and pig.' This commingling of remains of extinct, modern, and domestic animals occurs in the south sallyport; but we omit quoting them, as the deposits are said to be disturbed in that part of the cavern." (p. 54.)

In quotation VII. A. the Author, having mentioned the existence of a Table, in a Report of the British Association, showing the percentage of teeth found in the Cave-earth of Kent's Hole, proceeds to quote the percentages in his own peculiar way, but forgets to state the date of the volume. The reader will find the Table in the volume for 1874, page 17. He will also find that, while the Table includes the percentages for nine distinct branches of the Cavern, the Author selects five of them only; and that in each of the five he ignores certain species, such as the Bear, Badger, Rabbit, Deer, Lion, and Hare in the South Sally Port; the Bear, Sheep, Badger, Fox, Deer, Hare, and Beaver in the North Sally Port; the Bear, Badger, Fox, and Elephant in what he calls "Charcoal"—correctly the "Charcoal Cave;" and the Bear, Elephant, Deer, Lion, and Dog (?) in the Long Arcade.

The Cave of Rodentia is one of the nine branches included in the Table now under notice, but for some reason which does not appear the Author prefers apparently part of a Table on page 36 in the volume for 1872, or, more correctly, one of the three Tables on that page. This Table gives the actual numbers of teeth—not the percentages—found in each of the four distinct "Foot-levels" of Cave-earth. The Author, however, contents himself with the names of the Mammals and dispenses with the numbers. Here again he makes a selection, and ignores the Horse and Deer.

It will be observed that in his South Sally-Port list the Horse is twice mentioned; the second mention is presumably an uncorrected misprint for Hare.

These, however, are by no means the only errors. He inserts Wolf and Dog in the North Sally Port list on his own responsibility, as neither of these names occurs in the Table he professedly quotes.

Nor does he in all cases correctly quote the percentages: Thus he gives 1 per cent. instead of .5 per cent. for the Ox in

the North Sally Port; 44 p.c. instead of 29.5 p.c. for the Hyæna, 25 p.c. instead of 33 p.c. for the Horse, 15 p.c. instead of 10.5 p.c. for the Rhinoceros, and 1 p.c. instead of 2.5 p.c. for the Wolf in the Charcoal Cave; 41 p.c. instead of 41.5 p.c. for the Hyæna, 4 p.c. instead of 4.5 p.c. for the Fox, and .5 p.c. instead of 2.5 p.c. for the Pig in the Long Arcade.

Finally, he does not condescend to read foot-notes: Thus, a foot-note to the Table on page 17, in the Volume for 1874, states that only 1 tooth of *Machairodus latidens* was found; but he quotes it as 1 per cent. Another foot-note to the same Table says "There is reason to believe that the remains of Sheep in the Cave-earth had been introduced in comparatively recent times by burrowing Carnivores." We shall be able very soon probably to understand why he did not see this foot-note.

The word which he prints "Dog" is printed "Dog?" in the Table he professedly quotes, the query being affixed to show that it was doubtful whether the relics in question belonged to Dog or to Wolf; it being well known to Palæontologists to be difficult, if not impossible, to determine in some cases to which of the two species certain remains belong.

Having put his "facts" in order, the Author concludes thus: "In this cave the remains of this devourer of flesh are mingled with remains of horse, ox, wolf, fox, rabbit, dog, sheep, and pig. And the remains of these modern and domestic animals are largely mingled with those of extinct mammalia."

It is to be regretted that he did not explicitly name his "devourer of flesh." Among the mammals he selected, 7 species are Carnivores. The context shows that he did not allude to the Wolf, Fox, or Dog; but it is doubtful whether he meant the Hyæna, the Lion, the Bear, or Machairodus. He meant one of them of course, and that must suffice.

It is now obvious that the Author, meaning to make capital out of what he calls the mingling of remains of extinct, modern, and domestic animals, could neither afford to see the query affixed to the word "Dog," nor the foot-note explanatory of the presence of the Sheep in the Cave-earth.

One would rather not be called on to believe that any man would venture to write on the subject the Author has undertaken who was ignorant of the fact that the Horse, Ox, Wolf, Fox, and Pig are not only among "modern and domestic animals," but were also among the pre-glacial occupants of Britain. He quotes Professor Boyd Dawkins's *Cave Hunting* (1874) somewhat frequently, and at least ought to

have known that on page 418 of that work there is a list of the pre-glacial mammals of the famous Forest Bed of Cromer, which includes *Canis lupus* = Common Wolf, *C. vulpes* = Common Fox, *Cervus elaphus* = Red Deer, *Bos primigenius* = Ox, *Sus scrofa* = Pig, and *Equus caballus* = Horse.

He regards it as very noteworthy that the remains of the eight species he names should be mingled with those of extinct mammals, but does not say which are his "extinct species." In all probability, however, he considers the remaining six in his selected list—Hyæna, Lion, Bear, Machairodus, Elephant, and Rhinoceros—as being extinct. The last three are no doubt extinct, but the Author allows us to see (page 41) that he is aware that, according to some leading palæontologists, the "Cave Lion" and "Cave Hyæna" belong to existing species.

With regard to the Bear, the Author is surely aware that remains of three distinct species—*Ursus spelæus*, *U. priscus* = *U. ferax*, and *U. arctos*—occurred in the Cave-earth in Kent's Hole, and as the word "Bear," without qualification, is used in the percentage Table (*Report* 1874, p. 17) he has no means of knowing from the Table whether the Bear mentioned in it was *Ursus spelæus*—no doubt extinct, or *U. priscus*—the existing Fizzly Bear of North America,—or *U. arctos*,—the existing Brown Bear of Europe; or whether the Table included all three species.

Machairodus latidens.

Quotation VIII. A. "The other remains of machairodus in England" [besides the tooth found in 1876, in Robin Hood's Cave, Derbyshire] "were found in Kent's Hole. In 1826, Mr. MacEnery discovered several teeth of machairodus in the cave earth; and in 1872 Mr. Pengelly found a well-marked incisor in the first or uppermost level of cave earth, having over it about twenty-five inches of the granular stalagmite floor, and under it the teeth of hyæna, bear, and horse ('Antiquity of Man,' p. 105); and with it, as we have seen in the percentage table, the teeth of pig." (p. 43.)

B. "Some of the best evidence to show that the extinct mammalia lived on to a comparatively recent period is found in the reports of Kent's Cavern, read at the meetings of the British Association. In the report for 1874, we find that in the Long Arcade remains of rhinoceros, hyæna, mammoth, and machairodus were found in undisturbed cave-earth, together with remains of horse, fox, and pig. In the char-

coal" [Cave], "remains of hyæna, and rhinoceros were mingled with those of horse, wolf, ox, and sheep." (p. 54.)

The reader will find Sir Charles Lyell's statements respecting the incisor tooth of *Machairodus latidens* found in Kent's Cavern in 1872, not on page 105, but on pages 106 and 107, in the 4th edition (1873) of his *Antiquity of Man*. The tooth was found on 29th July, 1872, in the first or uppermost foot-level of Cave-earth, and with it, that is forming part of the same "find" (No. 5962), was the left lower jaw of Bear containing one molar tooth. About a yard on the west and in the same foot-level was a "find" (No. 5963) consisting of one tooth of Horse and one of Bear, while in the second foot-level and vertically under the famous incisor was a "find" (No. 5965) consisting of four teeth of Hyæna in part of the left lower jaw, one tooth of Bear, and one of Horse.

The Author could not, as the reader must naturally suppose, have got his information that the tooth had "over it about twenty-five inches of the granular stalagmite floor, from the *Antiquity of Man*, as Lyell is utterly silent on the question; but whence he did get it I have no means of ascertaining. The statement on the subject in the Eighth Report by the Cavern Committee (1872, p. 46) is that it had "over it the Granular Stalagmitic Floor 2·5 feet thick." It is impossible to suppose that the Author could have mistaken "2·5 feet" for "twenty-five inches;" yet, if not, whence came his statement?

Having told his reader that the incisor had "*under* it the teeth of hyæna, bear, and horse," the Author adds at once "*and with* it, as we have seen in the percentage table, the teeth of pig." Had he carefully studied how to lead his reader astray, he could scarcely have done better than to use, as he has, the prepositions "*under*" and "*with*," which I have italicised; for the reader would find it difficult, without further information, to avoid the conclusion that the teeth of Pig were found at least so nearly in contact with the tooth of *Machairodus*, that they all belonged to one and the same "find." As matters of fact, however, there were in the Long Arcade two "finds," and but two, containing teeth of Pig. The first (No. 6026) contained one tooth of Pig, found on the 10th December, 1872, in the 49th foot-parallel; that is nearly 5 months after the date, and 45 feet from the spot, on which the *Machairodus* tooth was found. The second (No. 6098) consisted solely of a right lower jaw of young Pig containing 8 teeth, found 26th March, 1873; that is about 8 months after

the date, and 96 feet from the spot, on which the incisor was met with. So much for teeth of Pig having been found *with* the relic of *Machairodus latidens*.

The occasional Contact of the two Stalagmites.

Quotation IX. A. "Below the cave earth, adds Mr. Pengelly, as we get away *south-westerly*, is another stalagmite, viz. the crystalline, and 'where the upper one' (the granular) was five feet, the lower was twelve feet. (President. Address. *Nature*, 1877, Glasgow Lect., 1876, p. 15.)

"In the report of the cave for 1869, we read: 'In proceeding *westward*, the cave earth thinned out entirely, and disappeared, so that the stalagmites' "'rested one immediately on the other.' (Rep. Brit. Asso., 1869, p. 193)." (pp. 4, 5.)

B. "The bulk of the stalagmites lie *westwardly* in the parts of the cavern remote from the *entrances*. As a rule, too, the cave earth thins out as it extends in a westward or south-westward direction, and the stalagmites thin out or are wanting towards the eastern part of the cave; so that they lie, for the most part, in opposite directions of the cavern; and where they meet they have thinned down to an inconsiderable thickness." (p. 5.)

C. "He" [Mr. Pengelly] "tells us, too, of such an abundant supply of stalagmite, as not only surmounted and completely encased the crystalline portion of a boss forty-three feet in basal circumference and thirteen feet in height, but 'flowing in vast sheets formed the thick granular floor, spreading far without a break in every direction. (Rep. Brit. Asso., 1874, p. 9.) This occurred in that part of the cave where the two beds of stalagmite were in contact, and where the stalagmite was the thickest, for there was no intervening cave earth. And this stream of calcareous matter formed the 'thick' floor of the granular or upper stalagmite, and where the upper one was five feet the lower one was little short of twelve feet. (Glas. Lect., 1876, p. 15.)" (pp. 7, 8.)

D. "In Kent's Cavern, as we have seen, *where the two layers of stalagmite were five feet and twelve feet respectively, they were in contact*; the granular bed lay immediately on the crystalline. (Lect., 1876, p. 24.) The cave-earth, where was its place, thinned out before it reached the place of contact." (p. 10.)

E. "'In proceeding westward,' it" [Report of the Cavern Committee, in *Rep. Brit. Asso.*, 1869, p. 193] "reads (that is

from the *entrances* where the thickest part of the cave-earth is found), 'the cave-earth *thinned out and entirely disappeared*, so that the two stalagmites, where was the cave-earth's proper place, rested one immediately on the other. At two feet beyond the point where the cave-earth was lost, it once more appeared between the stalagmites; but it was a mere patch running along the northern wall eleven feet long, six and a half feet wide in the widest part, and thirty-two inches deep, and was sealed up with the overlying floor of stalagmite *never quite a foot thick*. We are not told what was the thickness of the lower stalagmite at this point, but it was not the place where it was twelve feet; as where the upper one was five feet the lower one was twelve feet (Glas. Lect., 1876, p. 15), and the upper one here was not quite one foot. 'Across the chamber the sections of stalagmite ran towards the southern wall' (from the northern), 'and uniformly showed that they contained no cave-earth.'

"From this report we learn that the Cave-earth, as it runs westward, where the stalagmite becomes thick, thins out entirely, and with the exception of the thinned portion, and the small patch running along the northern wall, it is nowhere between the stalagmites, and where the stalagmite overlay the small patch, it was never a foot thick. Where, then, are two floors of stalagmite five and twelve feet thick, with a bed of cave earth or any quantity of cave earth between them?

"The bulk of the cave-earth was evidently forming in the eastern part of the cave while the thick portion of the stalagmites were forming in the western." (p. 21.)

Judging from Quotation IX., the Author seems to have arrived at the following conclusions:—

(a.) That in some one and the same vertical section the Granular Stalagmite was five feet thick, and the Crystalline Stalagmite was twelve feet thick.

(b.) That the said vertical section was apparently at or near the "Inscribed Boss" forty-three feet in basal circumference and thirteen feet in height.

(c.) If not at or near the "Inscribed Boss," he is doubtful about the exact part of the Cavern where the said vertical section was.

(d.) That the Cave-earth thinned out entirely towards the western or south-western part of the Cavern.

(e.) That the Stalagmites thinned out towards the eastern part of the Cavern, and were thickest in the western part.

It may be well to devote a few words to each of these conclusions.

(a.) The Author professes to have written the first paragraph of Quotation IX. on the authority of my Address at Plymouth in 1877, and my Glasgow Lecture published in 1876. Though he places the Address first, the Lecture alone seems to have been used by him. The following is the passage to which he alludes as it stands in the Address:—

“Beneath the Cave-earth there was usually found a Floor of Stalagmite having a crystalline texture, and termed on that account the *Crystalline Stalagmite*. It was commonly thicker than the Granular Floor, and in one instance but little short of 12 feet.” (*Rep. Brit. Assoc.* 1877, *Trans. of Sects.* p. 58, or *Nature* xvi. p. 320.)

The passage from the Glasgow Lecture (delivered 22nd December, 1875, but published in 1876) reproduced by the Author, is as near to verbal accuracy as he is likely to give a quotation. Indeed it is difficult to see why he named the Address as an authority, since he did not use it.

There are two reasons, however, why the Address should have been quoted rather than the Lecture:

1. The Address was written and read, and the words employed were certainly mine; while the Lecture was neither read nor written, but spoken, and the printed words ascribed to me by the reporter were possibly, but not certainly, mine. The Author is apparently much influenced by the word “where,” which he has italicised in the sentence, “*Where* the upper one was five feet the lower was twelve feet.” The word occurs, no doubt, in the report of the Lecture, but if I used it—about which I can say nothing at this distance of time—it was certainly not in the sense in which the Author, not perhaps unnaturally, understands it, but rather thus;—*Where* the Granular Stalagmite was thickest it was five feet, while the Crystalline Stalagmite, *where* thickest, was twelve feet.

As these maximum thicknesses have often been mentioned by me, it may be of service to quote what I am reported to have said on the subject on other occasions than those already referred to.

In the first Manchester Lecture (18th December, 1872, pp. 277, 280) we read “Below that” [*i.e.* the Black Mould] “was the Stalagmite varying in thickness from an inch to upwards of five feet. . . . The *Crystalline Stalagmite*, that is to say . . . the lower stalagmite . . . is in some places twelve feet thick.”

Again, the second Manchester Lecture (17th December, 1873, p. 125) says: "Below the Cave-earth is another Stalagmite of much greater thickness, being, in some cases, little short of twelve feet thick, whilst that above the Cave-earth nowhere much exceeds five feet."

Finally, in the second Glasgow Lecture (24th January, 1877, p. 15) it is said: "Below the Cave-earth we have the Crystalline Stalagmite, which is thicker than the Granular, usually in the proportion of about 12 to 5."

It is obvious, therefore, that the sense in which the Author understands the words attributed to me is not borne out by what I am reported to have said on the same subject in three other lectures; and it has been already shown that it is not borne out by my actual words in the Address at Plymouth.

2. I have always understood that when a writer has printed various editions of a work, or of an opinion, the latest of them, if any, is that which should be quoted. According to this canon, apparently the only fair one, the Address at Plymouth (16th August, 1877) should have been quoted by the Author. He names it, but makes no real use of it, as it probably did not quite suit his purpose.

Be all this as it may, it is not true that in any one and the same vertical section in Kent's Cavern the Granular Stalagmite was five feet thick and the Crystalline Stalagmite was twelve feet thick.

(b.) The Author, dealing, in Quotation IX. C., with the phenomena of the "Inscribed Boss" speaks in such a way that, at least, ordinary readers would understand that there was not the slightest doubt of the hypothetical vertical section being at or very near the Boss. It is only necessary to reply that the Granular Stalagmite five feet thick as well as the Crystalline Stalagmite twelve feet thick was a Floor or Sheet—not a Boss; that the locality of each was far away from the spot selected by the Author, and that they had both been discovered long before the explorers reached the Inscribed Boss—all of which facts the Author might have learned for himself by studying each and all of the Reports by the Cavern Committee.

(c.) The Author's anxious enquiry, in Quotation IX. E., "Where, then, are two floors of stalagmite five feet and twelve feet thick, *with a bed of cave earth or any quantity of cave earth between them?*" implies the hypothetical existence of a vertical section having these characters. Such a section

it has already been stated had no existence in Kent's Cavern. If, however, he will cut off from his question the words I have italicised, an answer to it can no doubt be found.

In the Fourth Report by the Cavern Committee (*Rep. Brit. Assoc.* 1868, pp. 49-57) there is a description of the South-west Chamber beginning thus: "The 'Lecture Hall' opens on its south-western side into an apartment, which, on account of its position in relation to the other branches of the Eastern Series, has been termed the 'South-west Chamber.'" (pp. 49-50.) It must be noted that the "South-west Chamber" is the south-western part, not of the Cavern, but of the Eastern Division of the Cavern.

The same Report (p. 54) says also "In the Western Division of the South-west Chamber, the very difficult exploration of which is now in progress, the thickness of the Stalagmitic Floor surpassed everything previously met with. Up to this time it has averaged more than 7 feet, in two instances only and over very limited spaces it was so little as 3 feet, and it has reached so much as 12.5 feet." Very nearly 12 feet of this thickness was the Crystalline Stalagmite; the remainder was the Granular Stalagmite immediately overlying it, without any intervening Cave-earth. The exploration of the South-west Chamber was begun 4th January, 1868, and ended on 22nd of the following December. The Floor of Crystalline Stalagmite nearly 12 feet thick was met with early in July of that year, and was in contact with the *eastern* wall of the Cavern.

For a description of the Granular Stalagmite 5 feet thick, without any included blocks of limestone, we have to turn to the Eighth Report by the Cavern Committee (*Rep. Brit. Assoc.* 1872, p. 45), where the following statement will be found in the description of the exploration of the "Long Arcade":—"At the western wall of the Arcade, and several feet from it, the Stalagmitic Floor was never less than 4, and not unfrequently upwards of 5, feet thick." This section, still to be seen, was cut early in July, 1872, at the north-eastern end of the Long Arcade, near the north-eastern end of the Western Division of the Cavern, but not more than 65 feet from the *eastern* wall of the Cavern. The bottom of the Cave-earth was not reached in this section, so that nothing can be said about the thickness, or, indeed, the existence of the Crystalline Stalagmite there.

The excavators did not reach the immediate neighbourhood of the "Inscribed Boss" until March, 1874, when the facts mentioned in Quotation IX. C. were disclosed, at the south-

western end of the Long Arcade, in the Western Division of the Cavern, and about 220 feet south-south-west from the spot occupied by the Granular Stalagmite five feet thick.

(d.) While it is undoubtedly true that the greatest thickness of the Cave-earth occurred in the Eastern Division of the Cavern, and that it thinned out here and there; it is equally true that it presented itself everywhere in the Western Division, and that the first instance met with of this thinning out was in the Eastern Division.

(e) The Author would find, on making a careful study of all the Reports by the Cavern Committee, that he was utterly wrong in his conclusion that the stalagmites thinned out towards the eastern part of the Cavern, and were thickest in the western part. We have already seen that by far the thickest example of the Crystalline Stalagmite was met with in the Eastern Division, and that the thickest section of the Granular Stalagmite, though in the Western Division was very much nearer to the Entrances—in the eastern wall of the Cavern—than to the south-western end of the Western Division. It should be added that the Author quotes a passage (p. 11) from my first lecture at Glasgow (22nd December, 1875, p. 24) in which the Granular Stalagmite is correctly stated as twenty inches thick. To this he not only offers no objection, but considers it suitable for his purpose. Now the spot at which this was found was not only in the *Eastern* Division, but no more than 34 feet from one of the Cavern Entrances, and 7 feet from the eastern wall of the Cavern; and the Granular Stalagmite it must be remembered had its full average of 20 inches thick.

Objects found in the Breccia.

Quotation X. A. "Below the whole occurred the breccia, composed of sub-angular and rounded pieces of dark-red grit, embedded in a sandy paste of the same colour, and containing *rude flint nodules*. (Mr. Pengelly's Presidential Address at Brit. Asso., 1877. Rep. Brit. Asso., 1877. Mr. Pengelly's Lect. at Glasgow, 1876)" (p. 3.)

B. "In this bottom bed are found certain rude pieces of flint and chert, said to have been the tools of men who visited the cave many hundreds of thousands of years ago. Indeed, these men, we are told, were savages of the lowest type, shown to be such by the rude tools they used, and which

with the position of their implements under layers of stalagmite and cave earth, that are supposed to have taken an immense time for their deposition, prove that an enormous time must have elapsed since those early men in Britain chipped their lumps of flint and chert, 'which were no better for chipping,' they were such lumpish fellows." (pp. 13-14.)

C. "At the very threshold of the inquiry it is assumed that these rude pieces of flint or chert found in the caves were chipped into 'tools' by the hand of man. They may have been, but the probability is that man never touched them till the explorers discovered them. The nodules found in the lowest bed in Kent's Cave, we are told, were no better for chipping; . . . Kent's Hole has evidently been excavated partly by the erosive action of water, and these nodules had probably been broken by collision as they were driven by the impetuous current." (p. 76.)

D. "In the Kent's Cave they" [the Breccia tools] "were nodules of flint and chert, and were more massive and less symmetrical than flakes." (p. 77.)

It will be observed that Quotation X. is made up of four excerpts, the Author referring to no authority except in the case of the first (A.), for which, according to his references, he obtained the materials from my Address at Plymouth (1877) and my first Glasgow Lecture (published in 1876). Though the words he uses are not a transcript of mine, they convey my meaning correctly until we reach those I have italicised, which are likely to lead his readers astray.

The Author in Quotation X. treats of the following topics :—

- (a) The specimens of flint and chert found in the Breccia.
- (b) The mental status of the Breccia men.

(a) He speaks of the Breccia as containing "rude flint nodules" (A), and refers to my Address and Lecture as his authority. The statement in the Address is "The Breccia . . . yielded evidences of human existence, but they were exclusively tools made from nodules, not *flakes*, of flint and chert" (*Rep. Brit. Assoc.* 1877, *Trans. Sects.* p. 59); while in the Lecture it is "There, too, we found evidence of man, in rude massive flint tools." (p. 19.) In the second excerpt (B) the "rude flint nodules" have been promoted to "rude pieces of flint and chert" . . . "*which were no better for chipping.*" The Author has put the six words I have italicised within quotation marks, but without any clue leading to him he

quotes; and lest the alleged uselessness of the chipping should be forgotten he says subsequently (C) "The nodules . . . we are told were no better for chipping."

To my astonishment the words "no better for chipping," or, more correctly, words assumed to be their equivalents, turn out to be my own. In this case the Author appears to have actually outdone himself in the dexterity—if that's the right word—of his manipulation. The words I actually used, as well as their context, will be found in my Paper on *The Flint and Chert Implements found in Kent's Cavern, Torquay*, read to the Plymouth Institution, 18th February, 1875, and printed in the *Transactions* of that body (v. 341-375). The best way, no doubt, to do full justice to the Author's skill as an advocate is to put the statements by myself and by the Author in parallel columns:—

Mr. Pengelly (1875).

"The implements found in the Breccia . . . were exclusively of flint and chert. They were much more rudely formed, more massive, less symmetrical in outline, and made by operating, not on flakes, but directly on nodules, of which portions of the original surface generally remain. . . . It is obvious, however, that even such tools could not be made without the dislodgment of flakes and chips, some of which would be capable of being utilized; and accordingly a few remnants of this kind were met with in the Breccia; but they were all of a very rude simple character and do not appear to have been improved by being chipped" (*op. cit.* pp. 357-8).

The Author (1882).

"These men, we are told, were savages of the lowest type, shown to be such by the rude tools they used, and which with the position of their implements under layers of stalagmite and cave-earth, that are supposed to have taken an immense time for their deposition, prove that an enormous time must have elapsed since these early men in Britain chipped their lumps of flint and chert, which 'were no better for chipping' they were such lumpish fellows" (pp. 13-14).

"The nodules found in the lowest bed in Kent's Cave, we are told, were no better for chipping" (p. 76).

It can be scarcely necessary to point out that the Author not only felt at liberty to substitute the words "were no better for chipping" for the original words "do not appear to have been improved by being chipped" and to put the substitute within inverted commas as if it were a word for word quotation, but at liberty also to apply the said words to the nodule-tools while he must have been perfectly aware that in the original they were exclusively applied to the dislodged flakes and chips. To prevent further doubt, it may be as well to state here that while the nodules were chipped, the flakes dislodged from them were not chipped.

The Author does not hesitate to say (C.) "The probability is that man never touched them" [the nodule-tools] "till the explorers discovered them," and to add that they "had probably been broken by collision as they were driven by the impetuous current" passing through the Cavern. I can only express my belief that had he studied the specimens themselves he would not hesitate to accept them as proofs of human existence.

In the last excerpt (D) in Quotation X. the Author says the nodules of flint and chert "were more massive and less symmetrical than flakes." These words, it will be observed, though he gives no hint of the fact, are almost identical with, and are no doubt an "improved" copy, of the words "more massive" [and] "less symmetrical in outline" which occur in the description of the Breccia nodule-tools, given in my Plymouth Paper already quoted. (See p. 810, line 20 above.) He sees fit to drop the words "in outline," and to fill their niche with "than flakes." He is quite welcome to the excision, but a few words may be said about his interpolation. He is well aware that I call the Flint-tools of the Cave-earth "Flint-flake Implements," and those of the Breccia "Flint-nodule Implements." (See my Glasgow Lecture, 1877, p. 24.) In my Plymouth Paper (1875) the former were thus described: "The principal flint and chert implements found in the Cave-earth . . . were *ovoid* and *lanceolate*, produced by fashioning, not flint or chert nodules, but flakes purposely struck off them. They were of comparatively delicate proportions, and usually characterized by bilateral symmetry" (*Trans. Plym. Inst.* v. 351); while the Breccia tools were described in the words already quoted. (See p. 810, lines 17-25 above.)

(b) The Author, speaking of the men represented by the tools found in the Breccia, says, "These men, we are told, were savages of the lowest type;" but by whom we are told it he does not say. So far as I am aware the following passage in my Plymouth Paper (1875) is the strongest ever used by me on the subject:—"Whether these old Cave-men, more and more rude as they were more and more ancient, were or were not incapable of anything beyond their savage state I will not venture to say." (*Trans. Plym. Inst.* V. 375.) Knowing nothing about savages of the lowest type, I must decline to entertain the question, Did the men of the era of the Kent's Hole Breccia touch that lowest level?

Objects found in the Bears' Den.

Quotation XI. "In the bears' den excavated by Mr. Mac Enery were found 'one tooth of horse, one of fox, two teeth of deer, four of hyæna, four of mammoth, and a few bits of coarse pottery.' (*Nature*, 1877, p. 320; and Rep. Brit. Asso., 1877, pp. 2-4.) The evidence that these relics belonged to this lowest bed" [the Breccia] "amounts to a demonstration, and unquestionably shows that they were not deposited many long ages ago. Mr. Mac Enery's description of the 'find' is carefully written. He says that the lower sheet (of stalagmite) extended over the outer area of the whole den. The removal of the superincumbent bed of rubble (cave earth) which partially covered it, displayed the entire surface of the lower sheet, which exhibited a most singular appearance. Over the whole area it was cracked into large slabs, resembling flags in a pavement. The average thickness of the cracked sheet was about two feet, and possessed the hardness of rock; and but for the division into insulated flags, it would have been almost impossible to pierce it. 'Mr. Mac Enery,' says the reporter of the committee, 'had left, as was his wont, the materials where he found them;' but they were kept separate from other specimens, and were carefully collected by the committee. Here we find remains of horse, fox, deer, hyæna, mammoth, bear, and a few bits of coarse pottery, locked up in the bears' den, which were under the lower stalagmite two feet thick, harder than rock, and which, but for cracks which divided it into flags, it would have been almost impossible to pierce.

"These particulars of the discovery were carefully written down by an educated man, and the whole of the deposits, left in the place where they were found, were carefully collected by the committee. The report, drawn up and approved by them, was presented at the annual meeting of the British Association, and appears in their published report. Now here is a startling fact, which, if true, disposes of the remote antiquity theory, so far as this lower bed of Kent's Cavern is concerned." (pp. 14-15.)

The ordinary reader would naturally conclude from Quotation XI. that the Bears' Den was completely excavated by Mr. Mac Enery; that he discovered the teeth of Horse, &c., as well as the pottery, mentioned by the Author; that these relics were all found in the Breccia; that Mr. Mac Enery kept the excavated "materials" "separate from the other

specimens"—whatever that may mean; and, there being no indication to the contrary, that the Author had transcribed without any modification the passages he quotes professedly from *Nature* ("1877, p. 320") and the *Rep. Brit. Assoc.* ("pp. 2-4," he says, but really pp. 4-5). In order to show whether such conclusions would be correct or incorrect, the paragraph the Author uses and the use he makes of it are placed in parallel columns below:—

The Original.

"The ground broken by Mr. Mac Enery extended to a depth of from 8 to 20 inches over almost the entire area of the Bear's Den. As was his wont, he left the excavated materials almost where he found them, and, as in all previous cases of the kind, there were amongst them a large number of specimens which had been overlooked or neglected. These, carefully collected by the Committee, were kept apart from the relics they found in the deposits below his diggings, and, when the exploration of the Den was completed, such was their number and volume that a horse and cart were required for their removal from the Cavern. They included 1 tooth of Horse, 1 of Fox, 2 teeth of Deer, 4 of Hyæna, 4 of Mammoth, upwards of 200 of Bear, very numerous bones, especially of the vertebral column and feet, a crowd of broken bones and bone splinters, numerous balls of coprolite, and a few bits of coarse pottery." (*Rep. Brit. Assoc.* 1877, pp. 4-5.)

The Author's Version.

"In the bears' den excavated by Mr. Mac Enery were found 'one tooth of horse, one of fox, two teeth of deer, four of hyæna, four of mammoth, and a few bits of coarse pottery.' . . .

"'Mr. Mac Enery,' says the reporter of the committee, 'had left, as was his wont, the materials where he found them;' but they were kept separate from other specimens, and were carefully collected by the committee. Here we find remains of horse, fox, deer, hyæna, mammoth, bear, and a few bits of coarse pottery, locked up in the bears' den, which were under the lower stalagmite two feet thick."

The Author, as already stated, refers first to *Nature*, and then to the *Report* of the *Brit. Assoc.*, in support of his statements just quoted. The reader will perhaps be, if not mystified, at least amused to learn that there is neither mention nor allusion in *Nature* to the Bears' Den, or its contents, or any discoveries made in it.

It is now obvious that Mr. Mac Enery's excavation of the Bears' Den, instead of being complete, was never carried more than 20 inches deep in the Breccia; that, though he excavated the remains of Horse, &c., mentioned above, there

is no evidence that he ever *saw* them; that the Cavern Committee—not Mr. Mac Enery—kept the specimens they found in his excavated materials separate from all other specimens; and that the Author's mode of quoting and compiling is at once adroit and unsatisfactory.

The question, "Which deposit yielded the relics about which he is so anxious?" shall receive almost immediate attention. In the mean time, should it be asked, Could Mr. Mac Enery have probably or possibly failed to detect objects of interest which he certainly excavated? it is only necessary to reply that all his researches were carried on in candle-light alone, the deposits being examined almost where they were dug up and thrown into a heap; whereas all the materials excavated by the Cavern Committee, having been examined on the spot in candle-light, were at once removed outside the Cavern and re-examined in full daylight; and it is not too much to say that but for this re-examination in daylight, at least one half of the relics would have been overlooked.

Returning to the teeth and pottery, the Author says, "The evidence that these relics belonged to this lowest bed" [the Breccia] "amounts to a demonstration," but as he forgets to say what the evidence is, it may be well to show what Mac Enery says on the subject, and what has been the experience of the Cavern Committee.

The Bears' Den, about 67 feet long, from 8 to 38 feet wide, and, measured from the bottom of the Committee's excavation, from 8 to 15 feet high, had, as we have seen, been partially excavated by Mr. Mac Enery, who has left, not only descriptions of it, but a drawing representing a vertical section through its deposits, with indications of some of their contents. This drawing, the only one he left of any part of the Cavern, is now the property of the Torquay Natural History Society, and was included in Mac Enery's *Cavern Researches*, which I had the pleasure of printing *in extenso* in 1869 (*Trans. Devon. Assoc.* iii. 196-482.) "The annexed section," says Mr. Mac Enery, "will indicate the relative arrangement or position of the alternating strata" (*Ibid.* p. 311.). I had the pleasure also of introducing prints from this drawing in the Thirteenth Report on the Cavern in 1877, where the Author has certainly seen it. I reproduce it here with the cautionary remark that it must not be supposed to make anything like an approach to accuracy of scale. It will be observed that it represents a vertical section through four successive deposits, in which Mr. Mac Enery has inserted the following brief description—

the prefixed numerals and the words within square brackets being mine :

1. "Uppermost Stalagmite" [= Granular Stalagmite].
2. "A Græ. Uppermost loam. Iron blade, Hy, Bear." [= Album græcum. Cave-earth. Iron blade. Hyæna. Bear.]
3. "Undermost Stalag." [= Crystalline Stalagmite. At the base of this bed are representations of lower jaws, probably intended for those of Bear.]
4. "Second Loam." [= Breccia. There are here also representations of lower jaws, but somewhat larger than those in the bed immediately above.]

Now, Mr. Mac Enery had made excavations extending horizontally and continuously through a great part, but not the whole, of the area of the Den, descending completely through the two Stalagmites and the intermediate Cave-earth, but, as stated previously, not descending farther in any case than 20, and frequently not more than 8, inches deep in the Breccia. He recorded the occurrence of Hyæna and Bear in the Cave-earth, but made no mention of any other mammal, or of pottery.

Let us now turn to his text, where several descriptions of the Den and its contents will be found :

First, where he is speaking of the Breccia. "The remains of Bear prevail here to the exclusion of all others—of all ages—and of all periods brought down to their encasement in the mud." (*Trans. Devon. Assoc.* iii. 239.)

Second. "We have not yet done with this chamber. In the centre of it there was a double floor of stalagmite, between which was interposed a stratum of rubble, sparry pipes, a black flint knife, and spots of charcoal with shells of muscle" [*sic*] and oyster, but no red marl or its usual contents. (*Ibid.* p. 240.)

Third. "It further appears that the Bears den was peopled exclusively by generations of that animal." (*Ibid.* pp. 255–6.)

Fourth. "The floor of the Bears den was studded with pyramidal mounds of spar supporting corresponding pendants from the roof An irregular crust overspread the floor This crust was about a foot thick, and was based on a shallow bed of indurated rubble. . . . A great abundance of a" [bum] "græcum were observed in it, mingled with an unusual proportion of Bears teeth. On further examination it was found to exhibit a modern character by the presence of an iron blade much corroded. This unexpected discovery decided us to examine it thoroughly and to seek for the cause of this strange assemblage. In a low crypt in the wall of the Bears den I discovered a thin bed of sandy loam

glanced" [*sic*] "over with a slight paste. The remains of Bear were associated with skulls of Hy., Deer, Horse, Fox. It presented similar characters to the central bed.

"On clearing away a considerable space of which, points of concealed cones were observed to protrude upwards into the rubbly bed and as we advanced what we had hitherto imagined to be the rocky bottom discovered itself to be a second plate of stalagmite. . . . The under plate extended over the entire area of the cave . . . while the superincumbent bed of rubble and its thin sheet gradually disappeared towards the elevated sides and proved to be limited to the central basin of this chamber. . . . In a crypt in the side wall of this den there was discovered portions of the skull and carcase of a Hy. much mutilated and gnawed. It was enveloped in a thin stratum of loam and strewed over a solid crust of stalagmite at the same time with the central bed, but owing to its retired situation not disturbed or mixed with foreign matter. A. G." [= *Album Græcum*.]

"By the removal of this partial bed the entire surface of the lower crust was displayed. It exhibited a most singular appearance—the whole area was cracked into large slabs resembling flags in a pavement . . .

"The average depth of the cracked floor of stalagmite was about two feet. . . . The first flag we turned over displayed a curious spectacle. The skulls and bones of Bear crowded together adhered to its under surface. Flag after flag disclosed the same Phenomenon . . .

"But the distinguishing characteristic of the undisturbed Dilu" [*viu*] "m consists not only in the prevalence of Bears remains, but also in their ungnawed condition. No evidence could be discovered in a single instance of the marks of the teeth or of other indications of the presence of the Hyæna, or of any other ossivorous animal. . . . The remains of Water Rats and mice alone accompany them and from the marks of nibbling on some of the bones they appear to have been contemporaries with them and joint occupants of this den." (*Ibid.*, pp. 306–311.)

Fifth. "It is impossible to compute with any certainty the number of the teeth of the Bear in the range of the Bear's den. . . . I must therefore leave the reader to form some estimate himself when I state that the under surface of an area of * * * was literally paved with the remains of this animal exclusively in all the gradations of growth, wear and preservation." (*Ibid.* p. 365.)

* * * The asterisks denote a blank in the original.—W. P.

Sixth. "In the Bear's den the remains of that animal prevail exclusively." (*Ibid.* p. 455.)

Such is Mac Enery's testimony on the remains found in the Bears' Den. Its substance is briefly this:—

1. He found in the Bears' Den the four deposits—Granular Stalagmite, Cave-earth, Crystalline Stalagmite, and Breccia—intact and in their invariable vertical succession.

2. He found in the Cave-earth, but not below it, remains of Deer, Horse, Fox, and Hyæna—the last being represented by coprolites as well as bones. There were with them remains of Bear; but no mention is made of Mammoth or of Pottery.

3. He found in the Crystalline Stalagmite and the Breccia, but chiefly in the latter, a crowd of remains of Bear; but he is at great pains to state that, with the exception of what he calls Water Rats and mice, he found in these beds no trace of any other animal. Here again there is no mention of Pottery.

In his *Cavern Researches*, Mac Enery dwells at considerable length on Pottery he found in the Cavern, but all his statements are to the effect that it was met with above the Granular Stalagmite, and no instance is mentioned of its occurrence in or below that bed. The experience of the Cavern Committee during their continuous researches, from 28th March, 1865, to 19th June, 1880, is in perfect harmony with this.

The Pottery, as might have been expected, was chiefly found in the Eastern Division of the Cavern, and always in or on the Black Mould which, with the sole exception of the South-west Chamber, covered everywhere the Granular Stalagmite in that Division. Nevertheless, Pottery did occur in undisturbed areas in two Branches of the Western Division, where there was no Black Mould. Thus, in the description of the Charcoal Cave, in the Committee's Eighth Report, mention is made of certain objects found "lying on the surface of the Stalagmitic Floor" among which were "upwards of a dozen small pieces of very coarse friable pottery, of a reddish colour, without any trace of ornamentation, and in all probability parts of one and the same vessel." (*Rep. Brit. Assoc.* 1872, p. 39.) Again, their description of the Tortuous Gallery, in the Thirteenth Report, which the Author appears to have especially studied, contains mention of "3 bits of coarse friable black pottery" "found on the surface." (*Ibid.* 1877, p. 8.)

Several of the Committee's Reports contain mention of the examination by the Committee of Mac Enery's heaps of

excavated materials. (See *Reps. Brit. Assoc.* 1871, p. 11; 1872, pp. 32, 36; 1873, p. 203; 1874, p. 6; 1875, p. 10; and 1876, p. 6.) In the first of these, "several fragments of black pottery" are recorded among the objects thus found. It may be satisfactory to add that these fragments were met with in the Sloping Chamber, and were certainly not dug out of the Breccia, inasmuch as that deposit was not reached there.

I will only add that the Committee carried the excavation of the Breccia in the Bears' Den considerably below the depth reached by Mac Enery, but found neither pieces of pottery, nor remains of Hyæna or of any other Mammal not previously met with in the Breccia.

Such, so far as I am aware, is a full and correct statement of the evidence on the question raised by the Author. He may hold, and probably without the least detriment to Science, that it "amounts to a demonstration" that "remains of horse, fox, deer, hyæna, mammoth . . . and a few bits of coarse pottery, locked up in the bears' den, . . . were under the lower stalagmite," but if I have estimated aright the judgment of all candid unbiased thinkers, their verdict would be that the remains of horse, deer, hyæna, and mammoth belonged to the Cave-earth, and that the pottery lay primarily on the surface of the Granular Stalagmite, as in the Charcoal Cave and the Tortuous Gallery.

The Author expresses the opinion that "Mr. Mac Enery's description of the 'find' is carefully written" (see p. 812, line 10 above, and, having transcribed it after his own fashion, adds "These particulars of the discovery were written down by an educated man" (p. 812, line 29 above). It is to be feared that he is not careful to read the contexts of the passages he uses. Had he done so in the present case he would have read the following introduction to the description he admires so much:—"As Mr. Mac Enery broke ground in every part of the Bears' Den, the condition in which he found it can only be learned from the description which he has left, and which may be given in the following condensed form" (*Rep. Brit. Assoc.* 1877, p. 3); and he would have seen that the description he approved so much, and a part of which he copied with sundry "improvements," was, after all, nothing more than a condensed compilation, not by Mr. Mac Enery, but by Mr. Pengelly from Mac Enery's detailed description, which, as is carefully pointed out, will be found in the *Trans. Devon. Assoc.* (iii. 238-240, 272-274, and 307-316). I am

much obliged to the Author for the compliment, which, though unintentional, is none the less acceptable on that account.

When he says "Mr. Mac Enery's description of the 'find' is carefully written, the ordinary reader concludes, as a matter of course, that the "find" alluded to consisted of the teeth of horse, &c., and the "few bits of coarse pottery;" and in this conclusion he is confirmed when the Author adds "Here we find remains of horse, fox, deer, hyæna, mammoth, bear, and a few bits of coarse pottery, locked up in the bears' den, which were under the lower stalagmite" (p. 812, line 23 above). We have seen, however, that Mac Enery never speaks of any such "find," and never mentions Mammoth or Pottery. He records his detection of remains of Horse, Fox, Deer, and Hyæna; and he also records the fact that they were found above, not, as the Author says, below, the Crystalline Stalagmite,—in short, that they were in the Cave-earth, not the Breccia.

Two statements in Mr. Mac Enery's descriptions of his discoveries in the Bears' Den require a few words. The first is that he found an "Iron blade" in the Cave-earth (see p. 815, lines 5, 42 above), about which he says nothing more than that it was "much corroded." It is the only metallic object found in or below the Granular Stalagmite, by either Mac Enery or the Cavern Committee. He states also that the Granular Stalagmite was of limited horizontal extent as compared with the lower Stalagmite, and that it was not traversed by cracks. In each of these statements he was unquestionably in error. In my judgment the Iron blade had passed, had perhaps been put intentionally by some pre-Mac Enery visitor down through the Granular Stalagmite, as it would be easy for any object less than 2·5 inches in thickness to pass now through cracks to be seen in the said Stalagmite. Indeed, the presence of any thin comparatively recent object in even the Breccia—had any such been found—would have surprised no one acquainted with the facts stated by Mac Enery. The Iron blade, however, was the only object to be accounted for, and it went no further than the Cave-earth; while the Bears' Den was the only branch of the Cavern where such anachronisms were possible, the stalagmites elsewhere being quite free from cracks.

Mr. Mac Enery's second statement, alluded to above, is that in which he speaks of remains of Water Rats and Mice occurring with those of the Bear in the Breccia of the Bear's Den. (See p. 816, line 33 above.) It is probable that these words must be taken with some latitude, as he was not a comparative anatomist, and his identifications would require confirmation, especially in the case of small rodents. The Water Rat (= *Arvicola amphibius*, Penn.) has been asserted to be a British pre-glacial mammal, and to belong to the fauna of the Forest-bed of Cromer; but some authorities doubt this identification. Be this as it may, *Arvicola glareolus*, Schreb (= Red Field Vole); *A. intermedius*, Newton; *A. arvalis*, Pall., (= Continental Field Vole); *A. gregalis*, Pall., and *Mus sylvaticus*, Linn. (= Field Mouse), are all pre-glacial Forest-bed species. Of these the first and third are still living in Europe, the fourth lives still in Siberia, and the fifth belongs to the existing British fauna. There would, therefore, be nothing remarkable in remains of animals popularly termed Water Rats and Mice occurring in the Kent's Cavern Breccia.

“*Bits*” versus “*Fragments*.”

Quotation XII. “The committee say *if* the cracks described by Mac Enery at all approached that existing in the stalagmitic boss” [in the Bears’ Den], “then there might be some uncertainty respecting the position and chronology of some of the objects found in the underlying deposit. The crack that passes through the *boss* is from one quarter of an inch to two inches and one twentieth of an inch. . . . The width of the crack in the north-east corner” [of the Bears’ Den], “which runs from wall to wall, the committee say is half an inch. Is it conceivable that these objects should fall just in the cracks that divide large slabs of stalagmite, and that . . . pieces of coarse pottery (not described as ‘fragments,’ the word commonly used when the pieces are small) should find their way through two feet of stalagmite by cracks half an inch wide, or the width of the boss crack even?” (p. 16.)

In the foregoing Quotation the Author says “The crack that passes through the *boss* is from one quarter of an inch to two inches and one twentieth.” The Report from which he copied says “from .25 inch to 2.5 inches wide.” It is difficult to understand why he reduced 2.5 to “two and one twentieth,” that is to 2.05, thus diminishing the width by 9 twentieths of an inch. Is it possible that he does not know

the difference between 2·5 and 2·05? It is perhaps his second misinterpretation of ·5. (See p. 802, line 24 above.)

The Author speculates on the possibility of articles falling through cracks half an inch wide—in allusion to the crack in the north-east corner of the Den. Did he never lose a coin, or a penknife, or other article, which perversely showed the possibility of its falling accidentally through chinks in old floors? If not I have reason to envy him. The Report, however, confines itself to the crack, 2·5 inches wide, in the boss.

When the Author says the “pieces of coarse pottery” found in the Bears’ Den are “not described as ‘fragments,’ the word commonly used when the pieces are small,” he apparently regards it to be unnecessary to state by whom “fragments” is thus used, knowing that unless it were so used by the Committee the remark would not be germane to the question before him. It may be as well to state that in the Report quoted by the Author the pottery in question is spoken of neither as “pieces” nor “fragments,” but as “bits;” and we have now to enquire by what word the Cavern Committee commonly characterized small pieces of pottery.

It will be found, I believe, that pottery is mentioned in 10 only of the sixteen Reports, and that only in 6 of the ten is any word used having regard to size.

Thus, we have in the 1st Report “One small piece.” . . . and “A large number of fragments.” (*Rep. Brit. Assoc.* 1865, p. 21.)

In the 3rd, “Some of them are of considerable size.” (*Ibid.* 1867, p. 27.)

In the 7th, “Several fragments.” (*Ibid.* 1871, p. 11.)

In the 8th, “Small pieces” and “fragments.” (*Ibid.* 1872, pp. 39, 41.)

In the 13th, “A few bits,” and “3 bits.” (*Ibid.* 1877, pp. 5, 8.)

In the 14th, “3 bits.” (*Ibid.* 1878, p. 2.)

The upshot of the matter—“bits” being used three times and “fragments” the same number—fails to justify the Author’s assertion that “fragments” was “the word commonly used when the pieces were small.” Indeed, the numbers are not large enough to show that there was any common or customary usage in the matter. It may be added that the Reporter never used “fragments” to denote small pieces, and that the “bits” found in the Bears’ Den were small enough to have passed through the half inch crack, had experiment or accident given

them the opportunity of making the attempt. We have seen, however, that there is not the slightest reason for supposing that pottery was ever found in or below the Granular Stalagmite in the Bears' Den or elsewhere in Kent's Cavern.

Mr. Wallace's Estimate.

Quotation XIII. "We have adduced Mr. Wallace's calculations to show that they contain no new evidence in proof of man's antiquity, and how important it is that leaders of thought should give accurately the facts on which they base their conclusions. Here are four or five mistakes in the facts on which a gentleman of culture and great influence builds up an estimate of half a million years which have been required, he says, for the formation of the several deposits of Kent's Cave, one of which amounts to a difference of 150,000 years; an estimate which has been quoted by almost every writer who has attempted to prove the high antiquity of man, and has doubtless been accepted by many hundred thousands of persons both in Europe and America." (p. 22.)

I do not feel called on to fight other men's battles, especially when, as in the case of Mr. Wallace, they are well able to defend themselves. *Quotation XIII.*, however, is so closely connected with one of my early Papers, that I am simply attending to my own concerns in noticing it. *Nature* for 2nd October, 1873 (viii. 462-4) contains an Article by Mr. A. R. Wallace, in which he makes some calculations respecting the time represented by the deposits in Kent's Cavern; and in my *Notes on Recent Notices of the Geology and Palæontology of Devonshire, Part I.*, I direct attention to inaccuracies in the data he employs. (See *Trans. Devon. Assoc.* vi. 668-670, 1874.) These inaccuracies became known to the Author of the paragraph forming *Quotation XIII.*, through my *Notes* just mentioned, in all probability, inasmuch as he is certainly acquainted with the said *Notes*, as we have already seen. (p. 791, line 26 above.) He quotes Mr. Wallace in his own peculiar way, and points out the inaccuracies, but without the least hint that they had previously been dealt with, and that all the corrections were obtainable from my *Notes*.

He closes the subject with the paragraph at the head of this Note, and quite surprises me by speaking of the conclusion Mr. Wallace had arrived at as "an estimate which has been quoted by almost every writer who has attempted to prove the high antiquity of man." It is to be regretted that

he neither names nor refers to a single writer who has quoted the said estimate. Though not unacquainted with the Literature of the *Antiquity of Man*, I have no recollection of having seen more than two such quotations—that in my own *Notes* already mentioned, and that in the work now before us. It is, I believe, perfectly safe to say that the estimate is neither quoted nor alluded to in any of the following works:—Boyd Dawkins's *Cave Hunting* (1874), Southall's *Recent Origin of Man* (1875), Wilson's *Prehistoric Man* (1876), Dawson's *Fossil Men and their Modern Representatives* (1880), Boyd Dawkins's *Early Man in Britain* (1880), Geikie's *Prehistoric Europe* (1881), *The American Naturalist* from 1873 to date, and the *Reports of the Smithsonian Institution* from 1873 to date.

The following allusions, not quotations, are the only ones I have seen. They all occur in Southall's *The Epoch of the Mammoth and the Apparition of Man upon the Earth* (1878), and are unaccompanied by any reference as to whence they are derived, or by direct comment:—

“Mr. A. R. Wallace has suggested 500,000 years” (p. 23), presumably, from the context, for the beginning of the human period.

“It is incredible that pottery was manufactured in these Caves one or two or three (or, according to Mr. A. R. Wallace, five hundred thousand years ago).” (p. 73.)

“As to the stalagmitic floors, this is specified by Sir C. Lyell in his *Student's Elements of Geology* (p. 162) as one of the points on which he rests the antiquity of man; in which he is followed by Mr. John Evans, Professor James Geikie, Mr. A. R. Wallace, and others.” (p. 89.)

In short, so far as my reading has gone, Mr. Wallace's “estimate” has received next to no attention from those who have attempted to prove, or to disprove, “the high antiquity of man;” and when our Author, who speaks very positively, professes to have been more fortunate, I can only say, “Name, Name.”

And now, having dealt with all the Author's noteworthy Notices of Kent's Cavern, I will merely add that he devotes rather more than three pages (23–25) of his second Chapter to Windmill Hill Cavern, at Brixham, which is perhaps somewhat loftily pooh-poohed, and is finally dismissed with the remark that “The tools of man, lying in a cave-bed, together with the bones of the horse (*equus caballus*) and ox, could not prove that he was a denizen of Britain at a remote

period of the past" (25-26)—a style of argument with which we have already dealt.

The reader, having now had opportunity of forming an opinion respecting the Author's qualifications for the work he has undertaken, as well as his modes of performing it, will also be able to form his own opinion as to the success or failure of his effort.

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 1884 Goddard, Edwin, Trevanion, Wolborough Hill, Newton Abbot.
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 1881 Gordon, J., 4, Claremont Terrace, Exmouth.
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 1881 Gregory, A. T., Gold Street, Tiverton.
 1884 Grimbly, R. H., Wolborough Street, Newton Abbot.
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 1876 Guenett, Rev. J. F., Point-in-View, Lymptone, Exeter.
 1875 Guille, Rev. G. de Carteret, Rectory, Little Torrington.
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 1862 Hamilton, A. H. A., M.A., Fairfield Lodge, Exeter.
 1880 Hamlyn, James, Bossell Park, Buckfastleigh.
 1880 Hamlyn, John, Toll Marsh, Buckfastleigh.

- 1880 Hamlyn, Joseph, Bilber Hill, Buckfastleigh.
- 1878 Hamlyn, W. B., 4, Abbey Crescent, Torquay.
- 1873*Hanbury, S., Bishopstowe, Torquay.
- 1868 Harper, J., L.R.C.P., Bear Street, Barnstaple.
- 1874 Harpley, R. B., Shrewsbury House, York Road, West Hartlepool.
- 1862 HARPLEY, Rev. W., M.A., F.C.P.S., (HON. GENERAL SECRETARY), Clayhanger Rectory, Tiverton.
- 1878 Harris, Rev. E., M.A., 8, Wellswood Park, Torquay.
- 1877 HARRIS, Rev. S. G., M.A., Highweek, Newton Abbot (VICE-PRESIDENT).
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- 1869*Hayne, C. Seale, Kingswear Castle, Dartmouth.
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- 1862 Hearder, G. E., Chelston Cottage, Cockington, Torquay.
- 1865 Hearder, W., Rocombe, Torquay.
- 1883 Hearder, H. Pollington, M.P.S., 24, Westwell Street, Plymouth.
- 1868*Heberden, Rev. W., M.A., 14, Gloucester Place, Portman Square, London.
- 1875 Hedgeland, Rev. Preb., M.A., Penzance.
- 1883 Hele, J. C., The Knowle, Newton Abbot.
- 1880 Hewetson, T., Wear, Staverton, Buckfastleigh.
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- 1862 Hine, J., F.R.I.B.A., 7, Mulgrave Place, Plymouth.
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- 1881 Hodgson, Mrs., Bonaly Tower, Colinton, Scotland.
- 1872 Hooper, B., Bournbrook, Torquay.
- 1877 Hooper, J., Bellfield, Kingsbridge.
- 1879 Hooper, S., Reed House, Hatherleigh.
- 1872 Horniman, W. H., St. Norbert's, Torquay.
- 1871 Hounsell, H. S., M.D., Woodlands, Torquay.
- 1882 Howell, J. B., The Grange, Bow, N. Devon.
- 1868*HUNT, A. R., M.A., F.G.S., Southwood, Torquay (VICE-PRESIDENT).
- 1878 Hunton, T., B.A., Bronshill, Torquay.
- 1877 Hurrell, A. W., B.A., Knightrider Street, Doctor's Commons, London.
- 1877 Hurrell, Henry, LL.B., 1, Temple Gardens, London.
- 1876 Hurrell, J. S., Buttville, Kingsbridge.
- 1873 Hutchings, Rev. H., M.A., The Clintons, Teignmouth.
- 1868 HUTCHINSON, P. O., Sidmouth.
- 1877 Ilbert, W. R., Bowringsleigh, Kingsbridge.
- 1884 Jackson, Rev. P., Vicarage, Kingsteignton.
- 1877 Jane, Rev. J., Cathedral Close, Exeter.
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1883 Lipscomb, R. H., Syon House, East Budleigh.

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1879 Loveband, Rev. W. C., M.A., West Down Vicarage, Ilfracombe.

1881 Luke, Captain, R.N., J.P., Springfield, Exmouth.

1877 Luscombe, John, Alvington, Torquay.

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- 1873 Marsh Dunn, R. M., Carlton Lodge, Teignmouth.
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 1867***Merrifield**, J., LL.D., F.R.A.S., Gascoigne Place, Plymouth.
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 1862 **PENGELLY**, W., F.R.S., F.G.S., &c., Lamorna, Torquay.
 1882 Penzance Library.
 1884 Perks, R., Gordon, Torquay.
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 1864 Phillips, J., Moor Park, near Newton Abbot.
 1884 Plumptre, F. H., Teignbridge House, Kingsteignton.

- 1879 Plymouth Free Library.
 1880 Pode, T. D., Slade, Ivybridge.
 1862 Pollard, W., M.R.C.S., Southland House, Torquay.
 1882 Pope, W., Spencecombe, Copplestone, North Devon.
 1868 Porter, W., M.A., Hembury Fort, Honiton.
 1878*Powell, W., M.B., F.R.C.S., Hill Garden, Torquay.
 1876 Power, Rev. J., M.A., Altarnun Vicarage, Launceston.
 1876 Powning, Rev. J., B.D., Totnes.
 1879 Price, Right Rev. Bishop, M.A., Hoone Villa, Ilfracombe.
 1878 Pring, James H., M.D., Elmfield, Taunton.
 1874 Proctor, W., Elmhurst, Torquay.
 1867 Prowse, A. P., Horrabridge.
 1878 Pulliblack, Rev. J., M.A., St. Mary's Lane, Walton-on-the-Hill, Liverpool.
 1884 Pulling, F. S., M.A., Exeter College, Oxford.
 1862 PYCROFT, G., M.R.C.S., Kenton, Exeter.

 1881*Radford, D., Park House, Mount Radford, Exeter.
 1869*Radford, I. C.
 1868*Radford, W. T., M.B., F.R.A.S., Sidmount, Sidmouth.
 1876 Radford, Rev. W. T. A., Down St. Mary Rectory, Bow, North Devon.
 1872 Ramsay, H., M.D., Duncan House, Torquay.
 1873*Rathbone, T., M.A., Backwood, Neston, Cheshire.
 1877 Rayer, W. C., J.P., Holcombe Court, Wellington, Somerset.
 1872 Reichel, Rev. Oswald J., B.C.L., Sparsholt, Wantage, Berks.
 1869 Ridgway, Colonel, Sheplegh Court, Blackawton, South Devon.
 1862 Risk, Rev. J. E., M.A., St. Andrew's Chapelry, Plymouth.
 1877*Roberts, I., F.G.S., Kennessee, Maghull, Lancashire.
 1884 Robinson, J. F., Park Hill, Ipplepen, Newton Abbot.
 1882 Robinson, S.H., Gleniffer, Hollington Park, St. Leonards-on-Sea.
 1867 Rock, W. F., Hyde Cliff, Wellington Grove, Blackheath.
 1883 Rogers, W. H. Hamilton, F.S.A., Colyton.
 1870 Rolston, G. T., M.R.C.S., Stoke, Devonport.
 1878 Rooker, W. S., Bideford.
 1872 Rossall, J. H., M.A., Rock House, Torquay.
 1865 Row, W. N., J.P., Cove, Tiverton.
 1862 ROWE, J. BROOKING, F.S.A., F.L.S., Plymouth.
 1884 Rowell, J. W., Devon Square, Newton Abbot.
 1866 Russell, Lord Arthur J. E., M.P., 2, Audley Square, London.
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 1881*Saunders, E. Symes, Devon County Asylum, Exminster.
 1877*Saunders, J. Symes, M.B., Devon County Asylum, Exminster.
 1880 Saunders, W. S., 3, Rougemont Terrace, Exeter.
 1881 Savile, Lieut.-Colonel, J.P., Langdon, Dawlish.
 1876 Scott, T. A., Sommers, Reay Cottage, Reigate, Surrey.

- 1884 Scott, Rev. Canon, West Ham.
 1884 Scott, W. G., M.B., Queen Street, Newton Abbot.
 1884 Scratton, D. R., D.L., J.P. (VICE-PRESIDENT), Ogwell House,
 West Ogwell, Newton Abbot.
 1884 Sellicks, Rev. J., Newton Abbot.
 1882 Shelley, Sir John, Bart., Shobrooke Park, Crediton.
 1879 Shelly, J., 20, Princess Square, Plymouth.
 1881 SHIER, DAVID, M.D., 3, Claremont Terrace, Exmouth.
 1868 Sidmouth, Right Hon. Viscount, Upottery Manor, Honiton.
 1869* Sivewright, J., The Grove, Torquay.
 1878 Slade, S. H., Simla, Goodrington, Paignton.
 1878 Slade-King, E. J., M.D., L. San. Sc., Croft Side, Ilfracombe.
 1874 Smith, E., F.C.S., Strand, Torquay.
 1879 SMITH, Rev. Preb., M.A., Crediton.
 1874* Somerset, His Grace the Duke of, Stover, Newton Bushel.
 1884 Sparke, Moreton, Rooklands, Torquay.
 1874* *Spragge, F. P.*
 1882 SPRAGUE, F. S., Crediton.
 1874 Standerwick, R., Chagford.
 1883 Stapledon, J. N., Lakenham, Westward Ho!
 1868 STEBBING, Rev. T. R. R., M.A. (PRESIDENT), Ephraim Lodge,
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 1876 Stevens, H., Hazeldene, Ashburton.
 1872* Stewart-Savile, Rev. F. A., M.A., Kilnoria, Torquay.
 1880 Stockdale, W. Colebrooke, Bridgetown, Totnes.
 1876* Stone, J., Leusdon Lodge, Ashburton.
 1875 Strangways, Rev. H. Fox, Silverton Rectory, Collumpton.
 1869 Studdy, H., Waddeton Court, Brixham.
 1875* Sullivan, Miss, Broom House, Fulham.

 1876 Tanner, E. Fearnley, Hawson Court, Buckfastleigh.
 1877 Taylor, H., M.D., Ellerton, The Park, Nottingham.
 1880 Taylor, R. W., M.A., Kelly College, Tavistock.
 1881* Tebbitt, W., Brooklands, Dawlish.
 1882 Terrell, Rev. R., Topsham.
 1877 Thomas, Henry Drew, Dix's Field, Exeter.
 1872 Thomas, J. L., New Hayes, St. Thomas, Exeter.
 1872 Thomson, Spencer, M.D., Ashton, Torquay.
 1868 Thornton, Rev. W. H., B.A., North Bovey Rectory, Moreton-
 hampstead.
 1882 Tickell, Rev. H. du Maine, B.A., Crediton.
 1869* Tothill, W., Stoke Bishop, Bristol.
 1872 Tozer, Henry, Ashburton.
 1876 Tozer, Solomon, East Street, Ashburton.
 1883 TREADWIN, MRS. CHARLOTTE E., Cathedral Yard, Exeter.
 1876 Trehane, James, Wanbro', Torquay.
 1880 Trehane, John, St. David's Hill, Exeter.
 1876 Tucker, Edwin, Ashburton.

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ERRATA AND CORRIGENDA.

		for "Manchester" read "Worcester."
" 80	"	6, for "phenomena" read "phenomenon."
" 92	"	31, for "Francais" read "Francaise."
" 163	"	6 from bottom, for "1813" read "1812."
" 180	"	7, for "or" read "of."
" 184	"	2, for "166" read "293."
" 199	"	7, before "Rings" insert "three."
" 240	"	13, for "nemorous" read "numerous."
" 256	"	3, for "intractibility" read "intractability."
" 273	"	6 from bottom, for " <i>pusilus</i> " read " <i>pusillus</i> ."
" 357	"	11, for "231" read "245."
" 406	"	15 from bottom, for "piece" read "pieces."
" 452	"	6 from bottom, for "737" read "937."
" 568	"	25, for "I." read "II."
" 589	"	5, dele "to."
" 592	"	18 from bottom, for "day" read "lay."
" 601	"	8 from bottom, after "xv." insert "p. 292, ed. 1884."
" 642	"	16, for "vol. iv. pp. 697, vol. v." read "vol. v. p. 698."
" 642	"	20, after "x." insert "p. 223."
" 644	"	24, for "71" read "73."
" 659,	foot note,	for "204" read "212, Bohn's ed., 1849."
" 660,	line 17,	for "brick dark" read "brick dust."
" 733	"	16, for "regno" read "regni."
" 760	"	21, for "beaten" read "beating."
" 784	"	4, dele inverted commas at beginning of paragraph.

THE ANNUAL MEETING IN 1885.

THE ANNUAL MEETING AT SEATON

WILL COMMENCE

ON TUESDAY, JULY 21st, 1885.

68637.



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